NASA CROP CALENDARS

Wheat Barley Oats Rye Sorghum Soybeans Corn

Statistical Reporting Service, U.S. Department of Agriculture

CONTENTS

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General:

The National Aeronatics and Space Administration (NASA) Johnson Space Center at Houston, Texas contracted with the Statistical Reporting Service (SRS), U.S. Department of Agriculture, to develop crop calendars for wheat, barley, oats, rye, grain sorghum, soybeans, and corn for grain. This was for thirteen selected States and three Canadian Provinces in the major wheat producing regions. These calendars and supporting data would provide NASA with detailed information to more accurately determine when Earth Resources Technology Satellite (ERTS) data would provide the most accurate wheat acreage information. This would be used to minimize the amount of ground verified information (ground truth) needed. Since barley, oats, and rye are considered "confusion" crops, i.e., hard to differentiate from wheat in ERTS imagery, specific dates were estimated for these crops in the eight following operations or stages of development: (a) seed-bed preparation, (b) planting or seeding, (c) intermediate growth, (d) dormancy (e) development of crop to full ground cover, (f) heading or tasseling, and flowering, (g) harvesting, and (h) posting-harvest operations.

Seedbed preparation includes operations two months prior to planting. Fall plowing for spring seeded crops was classified as a post-harvest operation. Full ground coverage for row crops was when they had reached about one-half their mature height. Average row widths for row crops were also obtained. Post-harvest operations included operations which occur after harvest and until two months before planting. If stubble remained more than one month after harvest, States were asked to specify when post-harvest operations began.

Dates were obtained from thirteen State Statistical Offices (SSO's) by Crop Reporting Districts (CRD's) and the three Canadian Prairie Provinces. These States and provinces by wheat growing regions and classes were:

Region I, Hard red winter - Texas, Oklahoma, Kansas, Nebraska;
Region II, Hard red spring and durum - North Dakota, South Dakota, Montana, and the Canadian Prairie Provinces of Alberta, Saskatchewan, & Manitoba;
Region III, Soft, white winter and spring - Washington, Oregon, and Idaho;
Region IV, Soft red winter - Ohio, Illinois, and Indiana.

Data were also collected for corn for grain and soybeans in Region IV and grain sorghum in Region I. These crops are predominant in these areas, and were also considered confusion crops with wheat at various stages of development.

Dormancy dates were obtained from the SSO's for fall-sown crops. This is the time period when growing stops in the fall until growth begins in the spring. Dates were based on one of the following:

a) Soil temperature of 40° F., or b) Second 28° F. killing frost.

This report is organized into general comments by the thirteen States and three Canadian provinces. The comments give a synopsis of the State's growing conditions, special cropping practices and other characteristics which would be helpful in identifying crops from ERTS imagery.

The first four appendices relate to Canadian data and are self-explanatory. Appendix E shows 1969 acreage and production by Crop Reporting District for all wheat, winter, spring, and durum wheat, barley, oats, rye, grain sorghum, corn for grain, and soybeans. The yield by Crop Reporting District is a 1969-71 weighted average. The dot distribution maps in Appendix F were prepared by the Bureau of the Census.

The crop calendars are 35mm slides and each slide represents one CRD which contains the crops relevant to that area. The calendar is classified into eight separate stages of development or operation given earlier, i.e., seedbed preparation, planting or seeding, etc.

TEXAS

General: Data provided by our Texas State Statistical Office was based on their weekly crop weather data for 1970-1972. Most of the dates used on the chart were drawn from this data. The dates for dormancy were obtained by phone with personnel at the SRS office in Texas; we were given dates for the northern and southern (no dormancy) parts of the state, and interpolated for the areas in between. Harvest dates were taken from the 1973 Texas Small Grains Statistics booklet. There were none for rye, and so we established some for it by taking the harvest dates of wheat and moving them ten days ahead for rye. Barley harvest dates for CRDs 90 and 96 were drawn from those for 70 and 81.

Cropping systems: Cropping sequences were found to produce a significant difference in dryland wheat yields in the Northern High Plains. 2/ The wheat-fallow sequence produced the highest yields followed by wheat-sorghum-fallow and continuous wheat produced the lowest. Tillage operations on irrigated wheat in the Texas High Plains did not significantly affect wheat yields. 1/ Irrigated wheat acreage accounts for 45 percent of the total wheat acreage in this area. Tillage to incorporate the residues into the soil, i.e., plowing-under vs. no-till, is widely used in seedbed preparation. Some burning is also done to remove surface residues, i.e., heavy straw, thus reducing tillage requirements. Stubble-mulch farming of winter wheat has shown to be a practical and widely used method in the Southern Great Plains of Texas.3/

Several studies have been made regarding no-tillage systems. 4/ No-tillage systems will obviously create a problem in differentiating cropland in fallow and another crop being grown.

Bibliography:

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2. Johnson, Wendell C., and Ronald G. David, "Research on Stubble-Mulch Farming of Winter Wheat," Washington, D.C.: Government Printing Office, May 1972.

3. Musick, J. T., R. R. Allen, D. A. Dusek, and F. O. Wood, No-Till Seeding of wheat and Barley after Grain Sorghum Harvest," College Station, Texas: Texas Agricultural Experiment Station, June 1972.

4. Texas Crop and Livestock Reporting Service, (T.C.L.R.S.) "1973 Texas Small Grains Statistics," Austin, Texas: T.C.L.R.S., 1973.

5. Unger, Paul W., and Jessie J. Parker, "Tillage Systems for Irrigated Wheat Production on the Texas High Plains," 1971.

6. Unger, Paul., and Frank O. Wood, "Influence of Cropping Sequence on Dryland Winter Wheat Production on the Northern High Plains of Texas," 1971.

OKLAHOMA

General: The data and dates for wheat are quite good from the weekly weather-crop reports, but those for barley and oats are of lesser quality, especially at the beginning and end of a stage of development. State average dates are based on 1969 data. There is no rye data available from questionnaires, but the applicable dates were adjusted in relationship to the growth dates of wheat. The dates provided for full ground coverage on the small grains are figured for the time jointing begins in the spring until most of the crop has jointed, using the definition of "half height" as a criterion for small grains.

Harvest dates for wheat are taken from the Kansas Wheat Commission's Wheat - Field to Market. Those for the other crops are drawn from the Agriculture Handbook No. 283. Dormancy dates were obtained from our Oklahoma SSO personnel, and those average dates adjusted for the northern and southern parts of the State.

Cropping Practices: Planting of the bulk of all Oklahoma small grains takes place in the Fall (September and October), although some oats and barley acreage is spring-planted (for which some ground preparation must begin in February and March). The bulk of the rye crop is planted for winter grazing or cover crop, and much of the sorghum is intended for silage. Much of the farm land is cultivated on the summer fallow system in the Panhandle and throughout two or three tiers of counties along the western edge of the State adjacent to Texas (Crop Reporting Districts 1, 2, 3, and 4). In order to abate the threat to wind erosin and, also, to trap blowing snow on fields during the winter, some small grain stubble is allowed to remain on the ground in the Panhandle (especially Beaver County) from August until March or April the next spring. Sorghum is usually planted in 36 to 40-inch rows, if irrigated (as in the Panhandle) or intended for grain, or 30-inch rows if grown for silage.

The "heading" stage is the one time of the year when wheat and the "confusion crops" in the Oklahoma area can be differentiated by natural color. At that stage, wheat has dark tones of green; barley has a light or bright yellow-green tone; rye has a gray-greenish shade; and oats has a whitish-gray color (somewhat like that of flax in other areas).

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3. Preliminary Study of the Effect of Row Spacing and Plant Populations on the Yield and Moisture-Use-Efficiencies of Irrigated Grain Sorghum, H. E. Reeves, J. F. Stone, F. Davies; ibid. pp. 50-51.

4. Conventional vs. Stubble Mulch Tillage for Dryland Wheat Production; H. E. Reeves, R. H. Griffin II, J. M. Davidson, J. P. Alexander, and B. J. Ott; ibid. pp. 55-57.

5. Wheat - Field to Market, Kansas Wheat Commission; Chicago: Wheat Flour Institute; (no date).

6. Usual Planting and Harvesting Dates, Statistical Reporting Service, Washington, D. C.: Goverment Printing Office, 1972.

7. Date and Rate of Seeding Study on Winter Wheat, R. A. Peck and L. J. Croy; Goodwell, Oklahoma; Progress Report P-676; Oklahoma Agr. Exp. Station, pp. 23 January 1973.

8. The Effects of Conservation Bench Terrace on Dryland Crop Yields; J. P. Alexander, J. M. Davidson and J. F. Stone; ibid pp. 34-38.

9. Map of Oklahoma showing Research Station locations from Research Report 687, Page 9, August 1973.

10. Chemical Tillage of Wheat Land; J. M. Davidson; Progress Report 609; Oklahoma Agr. Exp. Station, pp. 14-15, May 1969.

KANSAS

General: The dates set for the Crop Reporting Districts (CRD's) were based on ten years of weekly crop-weather data. A new bulletin is being prepared with the latest twelve years through 1973 and will be available in the Fall of 1974.

The charts were based on the dates reported by the State, but with some changes. The dates given for "full coverage" are not considered to be valid, because they extend over the winter dormancy period; instead, the end date is accepted, and the beginning date established after the end of dormancy in the late winter. The dates given for post-harvest operations for oats and sorghum are used as harvest dates, and a gap of five to fifteen days used to establish the post-harvest operations. Other harvest dates were taken from the agriculture Handbook No. 283 (Usual Planting and Harvesting Dates), except for wheat, which came from the Kansas Wheat Commission's Wheat - Field to Market. Dormancy dates were obtained through conversations with our Kansas State Statistical office, and the average adjusted to the northern and southern parts of the State. We also considered data gathered from surrounding States and adjusted, accordingly.

Cropping Systems: Summer fallow and stubble mulch farming are two important cultural practices common over most of the major wheat producing areas of Kansas. Being familiar with these practices may be helpful in differentiating wheat from other crops.

Summer fallowing, as the attached map illustrates, is extremely important in Crop Reporting Districts 11, 24, 37, 42, 55 and 68. Fallowing means growing one crop every two years and this practice is used mostly for small grains -- primarily wheat. Land from which wheat was harvested in 1973 will not be worked and replanted to wheat until stubble is left undistributed to help trap moisture until just before seedbed preparation.

Stubble mulch (i.e., minimum tillage) farming is a widely accepted practice over most all of the dryland wheat areas of Kansas. As the name implies, stubble mulching describes a method of seedbed preparation where straw mulch is left on the soil surface at wheat seeding time. The protective surface residue has certainly proven to be a highly significant force in both moisture and soil conservation. This type of seedbed would have a distinctly different aerial appearance than the traditional clean seedbed where all trash and crop residue is plowed under.

KANSAS

Minimum tillage is advocated for grain sorghum growers in north central Kansas where 500,000 acres are grown (2). However as noted in that article and mentioned by King (1), pests may be more of a problem. Cephalosporium Stripe, which resembles the mosaic, is spread by a microscopic mite from volunteer wheat is often growing on the minimum tilled ground.

Double cropping of wheat land is important only in eastern Kansas. Most double cropping will occur in Crop Reporting District 99 and the south one-half of District 86. When moisture is adequate after wheat harvest, it is quite common for producers to burn the wheat straw immediately after harvest, disk the ground and plant soybeans. This operation would occur from about June 25 till July 10.

Thirty inch rows are by far the predominant grain sorghum row spacing in Kansas. In the very dry areas of Crop Reporting District 11, 36 inch rows are common and 20 inch rows are popular for irrigated grain sorghum in southwest Kansas.

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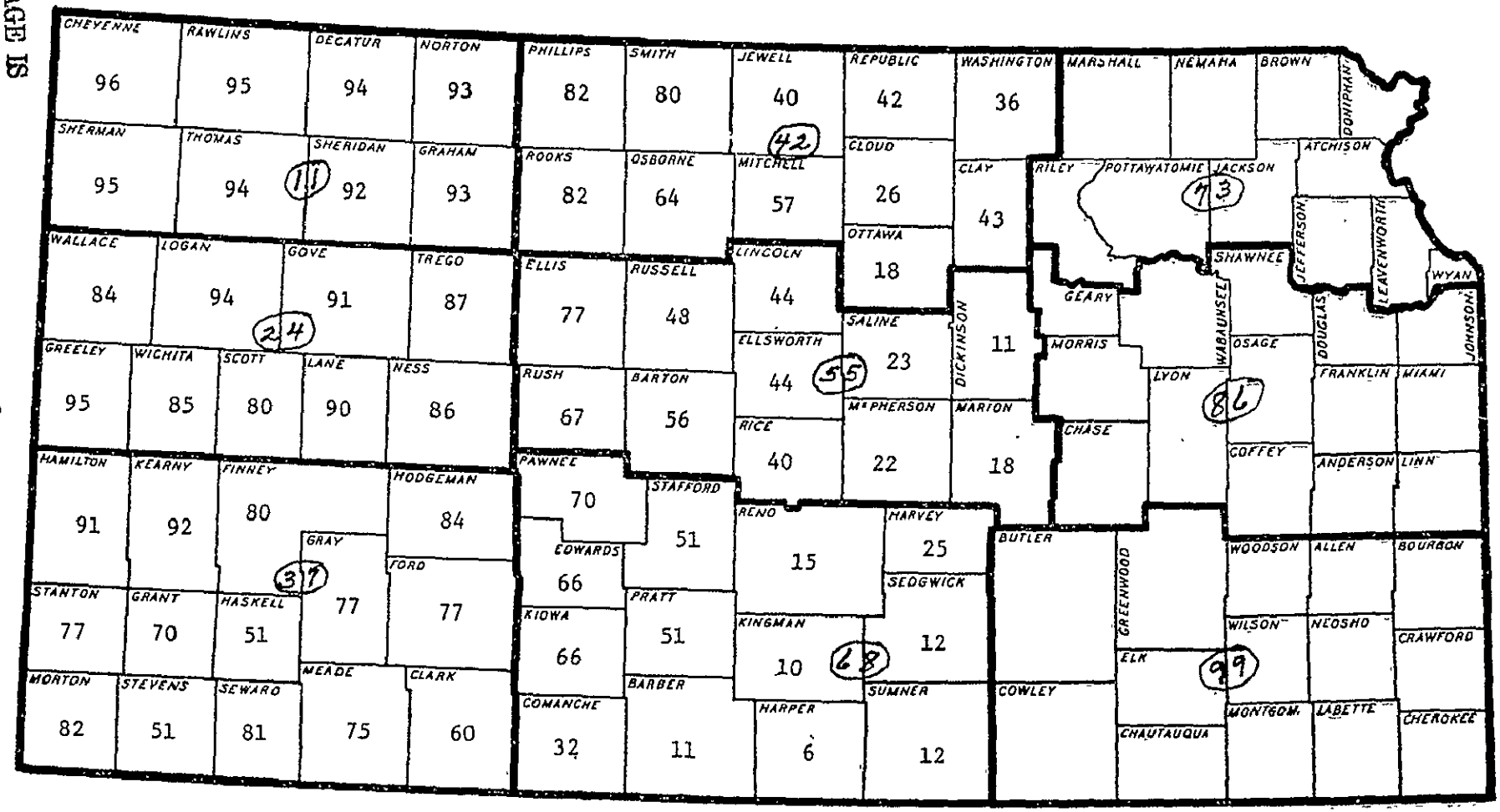
2. In Tillage, Less is More, Clyde Zimmerman; KANSAS FARMER, March 16, 1974, Page 8.

3. Usual Planting and Harvesting Dates, Statistical Reporting Service, Washington, D.C.: U. S. Government Printing Office, 1972.

4. Wheat - Field to Market, Kansas Wheat Commission, Chicago: Wheat Flour Institute, (no date).

Percent of 1972 Wheat Acreage on Summer Fallow

KANSAS



NEBRASKA

General: The crop calendar data are derived from a five-year normal, covering 1968 through 1972, using figures from the Weekly Crop - Weather Reports.. Dormancy dates were obtained from our Nebraska office, and harvest dates are drawn from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates).

The dates are discussed below, by crop:

Winter wheat - Three-quarters of the land is summer-fallowed, meaning that what is grown one year and the land left fallow (and then planted in the fall) the next. Post-harvest operations occur over the next spring and summer, and are therefore not shown on the charts. The remaining wheat cropland is continuously-cropped (one winter wheat crop every year), and the tillage operations occur in the fall after harvest and included here with seedbed preparation. The harvest and seedbed preparation dates are very close or coincide because seedbed preparation on summer-fallow land takes place a year after harvest. On continuously-cropped land, it takes place immediately after harvest ("right behind the combines").

Rye - Most rye is raised on summer-fallow land, and so post-harvest operations are not on the chart because they take place during the fallow year.

Oats - Oats are grown almost exclusively on summer-fallow land in CRD's 10, 20, and 70, and therefore (since they take place the next year) post-harvest operations are now shown on the charts. There is some continuous-cropping in the other districts; in district 30, tillage occurs in the spring and is included in the seedbed-preparation heading, while in 50, 60, 80, and 90 it takes place in the fall.

Barley - Post-harvest operations are now shown on the charts for CRD's 10, 20, and 70, because barley is grown on summer-fallow land. In the other districts, where there is some continuous-cropping, tillage occurs in the fall.

Grain sorghum - Sorghum is raised exclusively on summer-fallow land in districts 10, 20, and 70; therefore, post-harvest operations are now shown. In the other Crop Reporting Districts, some sorghum is grown on continuous-crop land. There is a little tillage in the fall, but most occur in the spring and is included in seedbed preparation.

Cropping Practices:

In Crop Reporting Districts 10, 20, and 70, crops are raised only on a summer-fallow system. Cultivation takes place in the other district on a mixture of summer-fallow land and continuously-cropped land. Oats are often grown as a cover crop, or (especially in CRD 30) as a companion crop for grass and legumes. Sorghum row widths average about 37 inches.

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Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

Williams, J.H., J.L. Hughes, and H.D. Wittmuss, "Double Cropping - Soybean after Winter Wheat."

NORTH DAKOTA

General: Seedbed-preparation data is derived from the State weather-crop reports. There is no entry in those reports for "full ground coverage," but the dates for "emerged and in the stooling or lesser stage" are used as the nearest equivalent. The dates for rye are based mainly on 1969 reports, while those for the other grains are taken from the 1955-1964 averages. These averages are also utilized to provide data in the "heading, flowering" and "post-harvest operations" categories, while the harvest date was determined from the 1969 weather-crop reports. Dormancy dates were obtained from our North Dakota office, and the end of dormancy is based on their data for ending pasture dormancy. Harvest dates were taken from Agriculture Handbood No. 283 (Usual Planting and Harvesting Dates).

The end date of the seed-bed preparation stage is the point at which 5% of the seed has been planted. For winter wheat seed-bed preparation refers to the working of summer-fallowed land one year after harvest. The dates for harvest and post-harvest operations, as given in the crop calendar, often conflict. The post-harvest dates were shifted to start after the harvest. Likewise, the full cover dates for winter wheat and rye in CRD's 1 through 6 have been shifted later to fit after the end of dormancy. All of the soil preparation for rye occurs in the fall, and is included in the charts under seed-bed preparation (the dates for which were changed by our state office). The dates for both harvest and post-harvest operations for durum wheat have been shifted to match those of spring wheat.

Cropping Practices: Wheat is grown almost exclusively on summer-fallow land, although some spring and durum wheat is raised on continuous-crop land. Much of the other crops are grown on continuous-crop land. The plowing of stubble after harvest to prepare for the winter crops depends upon soil moisture conditions, and is limited by the advent of severe weather conditions. Rye is grown continuously, and is planted in the fall stubble ground.

North Dakota's wheat crop is grown predominantly in the eastern and northwestern parts of the State, and especially in Crop Reporting Districts 1 and 3. Barley is raised mainly in the east (CRD's 3 and 6), while oats are raised mostly in the southeastern and western parts of the State (CRD's 1, 2, 4, 6, 7, and 9). Rye is cultivated in greater amounts in the south, and especially in northeast (CRD's 5, 6, 7, and 9), than elsewhere.

NORTH DAKOTA

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2. INFLUENCE OF SEEDBED PREPARATION ON SOME SOIL PROPERTIES AND WHEAT YIELDS ON STUBBLE; G. N. Geiszler, Ben K. Hoag, Armand Bauer, and Henry L. Kucera; Fargo, North Dakota: North Dakota Agricultural Experiment Station, 1972.

3. Usual Planting and Harvesting Dates, Statistical Reporting Service, Washington, D.C.: U.S. Government Printing Office, 1972.

4. VERY EARLY SEEDING OF WHEAT AND BARLEY, Ben K. Hoag, and G. N. Geiszler; from FARM RESEARCH, 30(4):32-34, Fargo, North Dakota: North Dakota Agricultural Experiment Station, March/April 1973.

5. WINTER WHEAT IN NORTH DAKOTA, Fargo, North Dakota: North Dakota Agricultural Experiment Station, March 1969.

SOUTH DAKOTA

General: The basis for these dates was the weekly crop weather ten-year averages (1960-1969) for seeding, heading and harvesting for each crop. Comparisons with recent years show these averages to be good indications of normal conditions. Detailed data on seedbed preparation and post-harvest operations by district was not available; therefore, a state average of spring and fall plowing dates was used along with the average seeding and harvesting dates to establish general dates for these operations.

The dormancy dates were provided by our South Dakota office, and are based on the dates when there is a 70% chance of a 28° freeze. Harvest dates were taken from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates).

Most winter wheat and rye are grown on summer-fallowed land, and this explains the positions of the lines on the charts for these crops. Being summer-fallow crops, they are planted and reach full coverage in the fall of the year in which the land lay fallow; they are harvested and worked (post-harvest operations) the next year, and not planted until the following year. The post-harvest operations dates were shifted later, so they would not conflict with the harvest dates, for winter wheat, rye, and barley.

Cropping Practices: The winter wheat and rye crops are grown mostly on summer-fallowed land, while the other crops are raised mainly on continuously-cropped land. Most of the row crops grown in South Dakota are raised in the eastern half of the state, although much wheat and hay are grown in the western part. Most of that area west of the Missouri River is devoted to range and pasture.

Wheat is grown over the entire State of South Dakota, but its distribution changes according to variety. Winter wheat is raised mainly in the southern half of the state, especially in the south central counties (Crop Reporting District 8), while most spring wheat is grown in the north (particularly the northeastern quarter, C.R.D.s 2, 3, 5, 6, and 9. Barley and rye, like spring wheat, are both raised mainly in the northeast; the major barley-producing counties are Brown, Marshall, Day, Spink, and Codington (C.R.D.s 2 and 3), and those for rye are Brown, Spink, Edmunds, and Faulk (C.R.D. 2).

Bibliography:

1. South Dakota Crop and Livestock Reporting Service (S.D.C.L.R.S.), Field Crops From Planting To Harvest, Sioux Falls, S.D.C.L.R.S., no date.

2. Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

MONTANA

General: Montana dates are based on Weekly Crop Weather data of five years, from 1968 through 1972. Montana data collected on phenological factors is not complete on seedbed preparation, full ground coverage, or post-harvest operations. Therefore, seedbed preparation was estimated, using planting date data as a "base factor"; full ground coverage, using boot or early boot data; and post-harvest operations, using end of harvest dates. A complicating factor is that almost all cereal grains that are non-irrigated are planted on summer-fallow ground. Thus, seedbed preparation operations actually begin the previous year prior to actual seeding. However, the dates submitted are for the final seedbed operations carried out just prior to seeding.

There can be no practical distinction between spring wheat and durum.

Dormancy dates were obtained from our Montana office. Harvest dates were taken from Agriculture Handbook No. 283 (Usual Dates of Planting and Harvesting).

Post-harvest operations and seedbed preparation dates are shown on the chart at the same time for winter wheat and rye. However, the post-harvest operations occur just after the harvest, before the land goes into summerfallow; the seedbed preparations take place the next fall, after the land had been in fallow.

Cropping Practices: Normally, most of the land is cultivated with stubble mulch. Cropping methods have been changing. More continuous cropping has been occurring (possibly due to higher wheat prices), and less strip farming has been taking place. No-tillage farming is being recommended to farmers whose weed control is good.

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1. Caprio, Joe, "Timing The Green Wave", from NOW, pp. 6-7, Bozeman, Montana: Montana State University, Spring 1973.

2. Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.; U.S. Government Printing Office, 1972.

WASHINGTON

General: The dates on the crop calendar are drawn from a review of Weekly Crop-Weather data, but subjectively: no specific years have been taken from those reports. Dormancy dates were obtained from our Washington State office, and harvest dates were taken from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates).

We had considerable difficulty delineating cropping operations for grain grown East of the Cascades. Summerfallow operations such as summer weeding were not considered as either seed-bed preparation or post-harvest work, even though they occur within two months of planting time. However, such operations as fall chiseling and sub-soiling were classified as post harvest, since this work is done on currently harvested land to prepare it for winter and subsequent summerfallowing the following year. Likewise, in continuous-crop areas, disking of stubble was considered as a post-harvest operation rather than a seed-bed preparation job. In reality though, this task is undertaken within two months of fall planting and is continuous with other seed-bed preparations. Washington dryland farmers normally concentrate on seeding their current summerfallow before working up ground (post-harvest operations) which has just been harvested and will be summerfallowed the following year. Therefore, beginning seed-bed preparation dates actually precede the beginning post-harvest operation dates.

Only spring plowing operations, and not those in the fall, are being used to determine the seed-bed preparation dates for barley. For this reason we have copied those of winter wheat (which have the same end dates as barley).

We have discontinued the fall starting dates for full coverage for winter wheat (except for CRD 01), so this phase does not extend over dormancy. Therefore, winter wheat full coverage begins after the end of dormancy. The fairly wide range in winter wheat heading dates reflects both the variation in planting times throughout a district and the large differences in elevations that occur in most of them.

Cropping Practices: The methods used by farmers in Washington are the standard ones, summerfallowing and continuous-cropping. There is no double-cropping, and there is no use of the no-tillage cultivation system.

Bibliography:

1. Morrison, Kenneth J., Carl D. Fanning, and Roland Hintze, "Supplemental Irrigated Wheat Production," Pullman, Washington: Cooperative Extension Service, July 1968.

2. Statistical Reporting Service, Usual Planting And Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

OREGON

General: The dates in the crop calendar were derived from Oregon Weekly Crop-Weather data and objective yield data. Harvest dates were taken from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates). Dormancy dates were obtained from our Oregon office. However, the dormancy dates are somewhat tentative, because some years CRD's 10 and 70 have no dormant period, but stay green all winter. In any case, seed-bed preparation and post-harvest operations are not halted during that time.

Winter wheat is raised on summer-fallowed land, so post-harvest operations are not shown, because they occur over the fall (after harvest), spring, and early summer (of the next year). For rye, oats, and barley, the soil is worked only once, and gradually, between harvest and planting. Therefore, the seed-bed preparation and post-harvest operations were combined. The dates for barley given in the crop calendar included both fall and spring-sown barley; those on the charts are those for fall-sown, and were taken from Agriculture Handbook No. 283.

Cropping Practices: The reason for the rather large variation in the planting season, maturity dates and harvesting periods is due to the tremenduous variation in weather and degree days brought about by differences in altitude. Oregon's farming ranges from near sea level 10 - 100 feet in the coastal valleys, to the high plateu which covers much of central to southeast Oregon where the average elevation is 4,000 feet plus. The major grain producing areas, for winter wheat and barley, are the Willamette Valley (district 10); the Columbia River counties (district 20); Umatilla County which is really a Columbia River county but is included in district 30; district 30, where the elevation ranges from 2,500 - 3,500 foot level, including Baker and Union Counties and Wallowa County (also district 30) which is sub-alpine (4,500 - 5,000 feed); and district 80, which includes the balance of eastern Oregon, averaging 4,000 feet plus.

All this variation usually takes place within one county in one district. For example, Gilliam County, a major producer of winter wheat and barley, is farmed from 200 feet to 3,500 feet elevation. The topography is macro-relief. One ranch, in fact one field, may vary 500 feet elevation difference and whole fields mature at different times. One always starts combining at the bottom of south slopes and works up lastly to north slopes. South slopes always mature before north slopes regardless of elevation. Barley and wheat are planted in the same field. A common practice found in wheat culture is surrounding a wheat field with 3 - 4 drill widths of barley with the intention of cutting if for hay. Oats are mostly fall seeded in the Williamette Valley while spring habit oats are predominantly seeded in district 30, primarily Klamath County. Oats in districts 20, 30 and counties other than Klamath are largely cut for hay.

OREGON

There is very little cultivation of grain crops in Crop Reporting District 70. Malheur County raises a lot of irrigated grain, mostly mixtures of barley, wheat, and oats, usually used for feed. There are large seedings and stands of crested wheat grass in Malheur, Harney, Lake and Klamath Counties. Other higher elevation counties, too, have come crested wheat grass. This crop may cause some trouble in crop identification.

Rye is grown mostly for hay in all areas. What we do call grain is generally used for seed and most is raised in district 10. Quite a lot of seed is used by orchardists for cover crops. Because of elevation differences, there is a very wide range of planting and harvesting dates. Naturally, the development stages follow this also. Post harvest operations are of some concern, as we do not understand exactly what is wanted. Some farmers get right on the ground, burn the stubble, plow and control weeds until time for planting. Others stubble-mulch and seed directly into the stubble and never plow or prepare a seed bed per se.

Again, because of elevation differences, fall seedings are subject to winter kill and therefore almost all growers some time before the seeding period runs out will reseed, perhaps to spring seeded varieties in the same field. Naturally these don't mature at quite the same rate but usually the fields are large enough that by the time harvest nears its end, the reseeded areas have ripened up.

Bibliography:

1. Oregon Agricultural Experiment Station, "Winter Wheat Pushed Back Calendar," From Oregon Agricultural Progress, 20 (1): 6, Summer 1973.

2. Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972

IDAHO

General: The 1973 Weekly Weather-Crop summaries, SCS, and Extension Service personnel were used as the information sources for this data. There will be some differences in the progress of the growth stages even over small areas, because of elevation differences - it will be slower on the higher-elevation slopes than on the lower.

Dormancy dates were obtained from our Idaho office. Harvest dates were taken from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates). The seedbed preparation and post-harvest operations for winter wheat and rye nearly coincide, so they have been combined on the charts.

Cropping Practices: Strip fallow and contour-fallow systems are followed in a few places in Idaho. Fall plowing is important, but more often, stubble will be left in the field for a month. The field is then deep-chiseled or roughed-up with other equipment to retain winter moisture. This land is then prepared in the spring for planting, or it may be summer-fallowed.

Most of the crops in Crop Reporting Districts 7 and 8 are grown with irrigation (in 6 to 8-inch row widths). District 9 has irrigated (6 to 8-inch rows) and dryland (10 to 14-inch rows) fields. District 1 has mostly dryland farming (with 6 to 8-inch row spacing). Idaho grows over 100,000 acres of mixed grains, mostly a mixture of spring barley and spring wheat, in Districts 7, 8, and 9. Both spring and winter-planted barley are grown, of which 90 percent is spring and 10 percent winter. Most winter barley is raised in District 1.

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Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

OHIO

General: All dates are based on Weekly Weather-Crop data from the last 5 years, the 1972-73 Ohio Agronomy Guide (Bulletin 472), Usual Planting and Harvesting Dates (Ag. Handbook 283), and state estimates. Dormancy dates were obtained from our Ohio SRS office, and harvest dates from Agriculture Handbook No. 283.

The full coverage dates for wheat and some of the barley have been shifted earlier, so their end dates do not conflict with the beginning of dormancy. The full coverage and heading dates for soybeans are the same, because of the definition of full coverage used by Ohio, which has to do with the height of the plants.

Cropping Practices: Most of the barley and rye grown in Ohio is fall-seeded, but a large proportion of the latter is grown as a cover-crop or is used as green manure and is plowed down. Recently, some corn (10,000 acres in 1973) has been planted on no-till land; row widths range from 20 to 40 inches, most commonly 28 to 30 inches. Row widths of soybeans range from 7 to 30 inches, usually about 20 inches.

There is a lot of double-cropping of wheat and soybeans in the southern part of the state (the southern parts of districts 4 and 5, all of 7 and 8, and a little of 9), using a no-tillage system.

Bibliography:

1. Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

2. Triplett, G.B., D.L. Jeffers, D.M. Van Doren, and C.R. Weaver, "Double Cropping", from Ohio Report, p. 24-27, March-April 1971.

3. Triplett, G.B., and R.W. Van Keuren, "Double Cropping-Corn Following Meadow", Wooster, Ohio: Ohio Agricultural Research and Development Center, 1972.

ILLINOIS

General: The listed dates for each crop are average based on weekly crop-weather data from 1969-1973. Very little data were available for barley and rye, since these two crops comprise only a small share of the total state crop acreage. The dates for barley are based in part on the dates for the operations or stages of development relating to oats (both crops spring-seeded). The dates for rye are based in part on the dates for the operations or stages of development relating to winter wheat (both fall-seeded).

Dormancy dates were obtained by adding ten to fifteen days to the average date of the first frost (thus getting the hard, 28° freeze) for the fall date, and by using the dates of the planting of oats, (from the Illinois Field Crops from Planting to Harvest booklet) as a sign that dormancy had ended. Harvest dates are taken from the Agriculture Handbook No. 283, Usual Planting and Harvesting Dates.

Because the dates for seedbed preparation and full cover, as given in the crop calendar, conflict with the start of dormancy, they have been shifted to earlier dates, those of rye. All post-harvest operations dates (except those for soybeans) have been shifted later, so that they do not conflict with the harvest dates.

Cropping Practices: There is much double-cropping of soybeans after wheat in Crop Reporting Districts 6, 7, 8, and 9. No-till methods are seldom used; instead, the ground is worked, and the stubble either broken up or turned under.

In 1973 the average row width for corn for grain in the State was 36.1 inches and the average row width for soybeans was 34.5 inches. These figures are based on objective yield survey data.

Bibliography:

1. Illinois Cooperative Crop Reporting Service (I.C.C.R.S.), Illinois Agricultural Statistics Field Crops From Planting To Harvest, Springfield: I.C.C.R.S., April 1970.

2. McKibben, G.E., and M.G. Oldham, "Double Cropping Soybeans in Small Grain Stubble," from Illinois Research, 10-11, Summer 1973.

3. McKibben, G.E., and J.W. Pendleton, "Double Cropping in Illinois," from Illinois Research, 10 (3): 6-7, Summer 1968.

4. Statistical Reporting Service, Usual Planting and Harvesting Dates, Washington, D.C.: U.S. Government Printing Office, 1972.

INDIANA

General: Most estimates are based on data from the Weather-Crop Reports for 1973, or are projections from these data; some estimates are from agronomy experts at Purdue University. Since no county estimates are made for rye, the 1969 acreage estimate for this crop is based on the 1969 Census distribution by District.

Dormancy dates were obtained from our office in Indiana. Harvest dates were taken from Agriculture Handbook No. 283 (Usual Planting and Harvesting Dates).

The harvest and post-harvest operations dates on the crop calendar conflict, so the post-harvest operations dates have been shifted somewhat later (this applies to wheat, rye, corn, oats, and soybeans). The seedbed preparation and full coverage dates for oats conflict and on the advice of our Indiana office, the seedbed preparation dates have been shifted earlier.

The dates for soybean full coverage and heading (podding) create a small problem. This is because of the definition of "full coverage" used by Indiana. They defined it as beginning when the soybean plants reach a height of 18 inches, but podding begins before then. Therefore, the lines on the charts for these stages overlap. If a height of 12 inches were used for full coverage, then it would begin about July 1.

Some winter wheat harvesting begins around June 20.

Cropping Practices: Cropping practices are relatively uniform over the State. Little contour farming is done, but because the southern part of the State, particularly Districts 8 and 9, are somewhat hillier than other areas, contour farming is more frequent in these districts compared with elsewhere in Indiana.

There is some double-cropping of soybeans following wheat in Crop Reporting Districts 7, 8, and 9. This is usually done with a limited tillage system, in which the stubble is chiseled into a mulch, which is left on the surface of the soil.

The row spacing of corn for grain declined steadily from an average of 39.3 inches in 1963 to 36.1 inches in 1971; it was 36.2 in 1972, and 35.5 in 1973. The average row spacing of soybeans fluctuates from year to year, generally between 35 and 36 inches; it measured 34.6 inches in 1973.

Bibliography:

Field Crops: Row Width and Population, Corn and Soybeans, Indiana Crop and Livestock Reporting Service (I.C.L.R.S.), Lafayette, Indiana: I.C.L.R.S., November 12, 1973.

Usual Planting and Harvesting Dates, Statistical Reporting Service, Washington, D.C.: U.S. Government Printing Office, 1972.

CANADA-THREE PRAIRIE PROVINCES

GENERAL: Statistics Canada was visited on June 27-28, 1974 in Ottawa, Ontario. Statistics on acreage, yield and production for spring wheat, barley, oats, fall and spring rye were obtained for the three Prairie Provinces (Alberta, Manitoba, and Saskatchewan) and are given in appendix A. Modal dates for spring wheat were obtained. All data were combined into the groups suggested by them.

Names and addresses of the seven research stations in the three Prairie Provinces were provided. All stations were contacted by memorandum to obtain data on plant color, average number of days between biological stages of development, when and how many times summer fallowing is cultivated, cropping systems, etc. (see appendix B). Four research stations responded and their replies are in appendix B. A summary of their replies are given in appendix C. Where wheat is mentioned, we are referring to spring wheat. Although some winter wheat is grown in the Prairie Provinces, it is a small amount compared with spring wheat acreage. 1/ Appendix D gives dates of average height, percentage seeded, percent cut, and percent threshing completed for wheat, oats, barley and spring rye as reported by the Alberta Wheat Pool in 1973.

CROPPING SYSTEMS: Summerfallowing is practiced extensively in Southern Canada. Land in summer fallow is cultivated 5-7 times during the 21 month cycle about every 4 to 5 weeks (See appendix C). The first cultivation is usually done around June 1 and, depending on moisture and weed problems, will be done 3 more times (monthly) that summer.

All research stations stated that the average growing period was about 94 days from seeding to swathing. The following is the average number of days during the growing period for 4 biological stages of development:

Seeding to emergence	10
emergence to full ground coverage	19
full ground coverage to heading	25
heading to swathing	40
	94

COLORING: Wheat has the darkest color when heading followed by barley and oats. Barley is a lighter green while oats are more gray - white in appearance.

Bibliography

1. Winter Wheat Production in Western Canada, Canadian Department of Agriculture Publication 1056, 14 pages, 1968 U. J. Pittman et al.

REGION II ALL WHEAT - 1971

APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	2,106	29.3	61,699	853	19.7	16,792
Group-2	413	29.8	12,301	167	20.0	3,348
Province	2,519	29.4	74,000	1,020	2/19.8	1/20,139
SASKATCHEWAN						
Group-1	6,722	23.9	160,672	2,722	16.1	43,728
Group-2	4,724	29.4	138,983	1,913	19.8	37,825
Group-3	1,477	30.7	45,345	598	20.6	12,341
Province	12,923	26.7	345,000	1/5,234	17.9	93,893
ALBERTA						
Group-1	1,982	24.7	48,963	803	16.6	13,326
Group-2	1,029	29.5	30,360	417	19.8	8,263
Group-3	432	27.0	11,677	175	18.1	3,178
Province	3,443	26.4	91,000	1/1,394	2/17.7	1/24,766
3-PRAIRIE Provinces	18,885	27.0	510,000	7,648	18.1	1/138,799

1/ Does not add due to rounding.
2/ Yield calculated on domestic unit data.

REGION II ALL WHEAT--1972

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	2,150	26.6	57,186	871	17.9	15,563
Group-2	450	26.3	11,814	182	17.7	3,215
Province	2,600	26.5	69,000	1,053	17.8	1/ 18,779
SASKATCHEWAN						
Group-1	6,755	22.6	152,769	2,736	15.2	41,577
Group-2	5,170	24.0	124,195	2,094	16.1	33,800
Group-3	1,975	24.8	49,036	800	16.7	13,345
Province	13,900	23.4	326,000	5,630	15.7	1/ 88,723
ALBERTA						
Group-1	2,477	26.6	65,877	1,003	17.9	17,929
Group-2	1,271	29.6	37,601	515	19.9	10,233
Provinces	3,748	27.6	103,478	1,518	18.5	28,162
3-PRAIRIE Provinces	20,248	24.6	498,478	1/ 8,200	16.5	1/135,663

1/ Does not add due to rounding.

REGION II ALL WHEAT--1973

APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals Per hectare	Production metric quintals (000)
MANITOBA						
Group-1	2,527	25.8	65,240	1,023	17.3	17,755
Group-2	573	25 8	14,760	232	17.3	4,017
Province	3,100	25.8	80,000	1/1,256	17.3	21,772
SASKATCHEWAN						
Group-1	7,865	22.6	177,412	3,185	15.2	48,284
Group-2	6,127	25.8	158,038	2,481	17.3	43,011
Group-3	2,208	27.0	59,550	894	18.1	16,207
Province	16,200	24.4	395,000	1/ 6,561	16.4	1/ 107,501
ALBERTA						
Group-1	2,887	25.9	74,914	1,169	17.4	20,388
Group-2	1,444	30.7	44,282	585	20.6	12,052
Group-3	569	26.0	14,804	230	17.5	4,029
Province	4,900	27.3	134,000	1/ 1,985	18.3	36,469
3-PRAIRIE Provinces	24,200	25.2	609,000	1/ 9,801	16.9	165,742

1/ Does not add due to rounding.

REGION II BARLEY--1971

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	1,649	46.4	76,575	667	24.9	16,672
Group-2	403	43.2	17,425	163	23.2	3,794
Province	2,052	45.8	94,000	831	24.6	20,466
SASKATCHEWAN						
Group-1	1,895	41.4	77,009	767	22.4	16,766
Group-2	2,363	47.6	112,462	957	25.6	24,485
Group-3	1,349	46.4	62,529	546	24.9	13,614
Province	5,571	45.2	252,000	2,256	24.3	54,865
ALBERTA						
Group-1	2,090	44.8	93,734	846	24.1	20,408
Group-2	2,214	38.9	86,107	897	20.9	18,747
Group-3	1,385	31.9	44,159	561	17.1	9,614
Province	5,689	39.4	224,000	2,304	21.2	48,769
3-PRAIRIE Provinces	13,312	42.8	570,000	5,391	23.0	124,100

REGION II BARLEY--1972

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	1,690	41.5	70,161	684	22.3	15,275
Group-2	410	36.2	14,839	166	19.5	3,231
Province	2,100	40.5	85,000	851	21.8	18,506
SASKATCHEWAN						
Group-1	1,341	38.0	50,922	543	20.4	11,087
Group-2	1,873	38.2	71,549	759	20.5	15,578
Group-3	1,386	39.3	54,529	561	21.1	11,872
Province	4,600	38.5	177,000	1,863	20.7	38,536
ALBERTA						
Group-1	1,726	49.4	85,252	699	26.6	8,561
Group-2	2,176	44.8	97,468	881	24.1	21,221
Group-3	6,498	42.7	277,280	2,632	23.0	60,369
Province	10,400	44.2	460,000	4,212	23.8	100,151
3-PRAIRIE Provinces	17,100	42.2	722,000	6,926	22.7	157,194

REGION II BARLEY--1973

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	1,682	41.2	69,293	681	22.1	15,086
Group-2	418	32.8	13,707	169	17.6	2,984
Province	2,100	39.5	83,000	851	21.2	18,071
SASKATCHEWAN						
Group-1	1,034	39.0	40,363	419	21.0	8,788
Group-2	1,746	40.0	69,873	707	21.5	15,213
Group-3	1,420	37.9	53,764	575	20.4	11,705
Province	4,200	39.0	164,000	1,701	21.0	35,706
ALBERTA						
Group-1	1,644	44.6	73,391	666	24.0	15,979
Group-2	2,138	39.8	85,138	866	21.4	18,536
Group-3	1,268	34.3	43,471	514	18.4	9,465
Province	5,050	40.0	202,000	2,045	21.5	43,979
3-PRAIRIE Provinces	11,350	39.6	449,000	4,597	21.3	97,756

REGION II SPRING RYE -- 1971 APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1			N O E S T I M A T E S			
Group-2						
Province						
SASKATCHEWAN						
Group-1	10.9	15.4	168.1	4.4	9.7	42.7
Group-2 1/	1.9	19.6	37.2	.8	12.3	9.6
Group-3 2/	12.8	18.3	234.7	5.2	11.5	59.6
Province	25.6	17.2	440.0	5/10.3	10.8	5/111.8
ALBERTA						
Group-1	16.4	18.3	299.5	6.6	11.5	76.1
Group-2 3/	6.8	19.6	133.0	2.7	12.3	33.8
Group-3 4/	0.4	18.8	7.5	.1	11.8	1.9
Province	23.6	18.6	440.0	5/ 9.5	11.7	111.8
3-PRAIRIE Provinces	49.2	17.9	880.0	19.9	11.2	223.5

1/ Crop Districts 5, 8.
2/ Crop Districts 6, 7, 9.
3/ Crop Districts 4A-6.
4/ Crop District 7.
5/ Does not add due to rounding.

REGION II SPRING RYE--1972

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
SASKATCHEWAN						
Group-1	8.5	15.9	135.8	3.4	10.0	34.5
Group-2	1.4	17.4	24.4	.6	10.9	6.2
Group-3	10.1	16.8	169.8	4.1	10.5	43.1
Province	20.0	16.5	330.0	8.1	10.3	83.8
ALBERTA						
Group-1	13.7	19.5	267.7	5.5	12.2	68.0
Group-2	5.9	17.7	104.7	2.4	11.1	26.6
Group-3	.4	19.0	7.6	.2	11.9	1.9
Province	20.0	19.0	380.0	8.1	11.9	96.5
3-PRAIRIE Provinces	40.0	17.8	710.0	16.2	11.2	180.3

REGION II SPRING RYE--1973 APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
SASKATCHEWAN						
Group-1	9.6	15.8	152.1	3.9	9.9	38.6
Group-2	1.6	17.4	27.9	.6	10.9	7.1
Group-3	8.8	15.9	140.0	3.6	10.0	35.6
Province	20.0	16.0	320.0	8.1	10.0	81.2
ALBERTA						
Group-1	13.5	19.7	266.5	5.5	12.4	67.7
Group-2	6.1	20.5	125.5	2.5	12.9	31.9
Group-3	.4	2.0	8.0	.2	1.3	2.0
Province	20.0	20.0	400.0	8.1	12.5	101.6
3-PRAIRIE Provinces	40.0	18.0	720.0	16.2	11.3	182.9

REGION II OATS-FOR GRAIN - 1971

APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	1,125	54.9	61,751	456	19.7	8,963
Group-2	270	52.8	14,249	109	18.9	2,068
Province	1,395	54.5	76,000	565	19.5	11,031
SASKATCHEWAN						
Group-1	649	51.2	33,206	263	18.3	4,820
Group-2	800	59.6	47,660	324	21.4	6,918
Group-3	517	58.3	30,134	209	20.9	4,374
Province	1,966	56.5	111,000	796	20.2	16,112
ALBERTA						
Group-1	539	52.5	28,303	218	18.8	4,108
Group-2	978	54.6	53,388	396	19.6	7,749
Group-3	437	44.2	19,309	177	15.8	2,803
Province	1,954	51.7	101,000	791	18.5	14,660
3-PRAIRIE						
Provinces	5,315	54.2	288,000	2,153	19.4	41,803

REGION II OATS-FOR GRAIN--1972

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	906	49.7	45,001	367	17.8	6,532
Group-2	234	42.7	9,999	95	15.3	1,451
Province	1,140	48.2	55,000	462	17.3	7,983
SASKATCHEWAN						
Group-1	592	47.8	28,325	240	17.1	4,111
Group-2	667	46.5	31,012	270	16.7	4,501
Group-3	431	45.6	19,663	175	16.3	2,854
Province	1,690	46.7	79,000	684	16.7	11,467
ALBERTA						
Group-1	528	57.4	30,293	214	20.6	4,397
Group-2	935	58.1	54,345	379	20.8	7,888
Group-3	2,197	56.2	123,362	890	20.1	17,906
Province	3,660	56.8	208,000	1,482	20.4	30,191
3-PRAIRIE						
Provinces	6,490	52.7	342,000	2,628	18.9	49,641

REGION II OATS-FOR GRAIN--1973

APPENDIX A

Province	Acres (000)	Yield Bushels	Production Bushels (000)	Hectares (000)	Yield Metric Quintals	Productions Metric Quintal (000)
MANITOBA						
Group-1	1,008	49.8	50,205	408	17.8	7,287
Group-2	292	43.8	12,795	118	15.7	1,857
Province	1,300	48.5	63,000	527	17.4	9,144
SASKATCHEWAN						
Group-1	696	47.0	32,710	282	16.8	4,748
Group-2	793	48.7	38,651	321	17.5	5,610
Group-3	511	54.1	27,639	207	19.4	4,012
Province	2,000	49.5	99,000	810	17.7	14,370
ALBERTA						
Group-1	549	53.2	29,222	222	19.1	4,242
Group-2	1,028	57.8	59,373	416	20.7	8,618
Group-3	423	53.0	22,405	171	19.0	3,252
Province	2,000	55.0	111,000	810	19.7	16,112
3-PRAIRIE Provinces	5,300	51.5	273,000	2,147	18.5	39,626

REGION II FALL RYE -- 1971

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	102.9	24.9	2564.7	41.7	15.6	651.4
Group-2	24.1	28.4	685.3	9.8	17.8	174.1
Province	127.0	25.6	3,250.0	51.4	16.1	825.5
SASKATCHEWAN						
Group-1	289.9	21.2	6,155.5	117.4	13.3	1,563.5
Group-2 1/	48.1	23.5	1,131.8	19.5	14.7	287.5
Group-3 2/	164.0	21.4	3,512.7	66.4	13.4	892.2
Province	502.0	21.5	10,800.0	203.3	13.5	2.743.2
ALBERTA						
Group-1	179.6	25.7	4,606.9	72.7	16.1	1.170.2
Group-2 3/	39.2	20.8	816.0	15.9	13.0	207.3
Group-3 4/	7.2	19.0	137.1	2.9	11.9	34.8
Province	226.0	24.6	5,560.0	91.5	15.4	1,412.?
3-PRAIRIE Provinces	855.0	22.9	19,610.0	346.3	14.4	4.980.9

1/ Crop Districts 5,8.
2/ Crop Districts 6, 7, 9.
3/ Crop Districts 4A-6.
4/ Crop District 7.

REGION II FALL RYE--1972

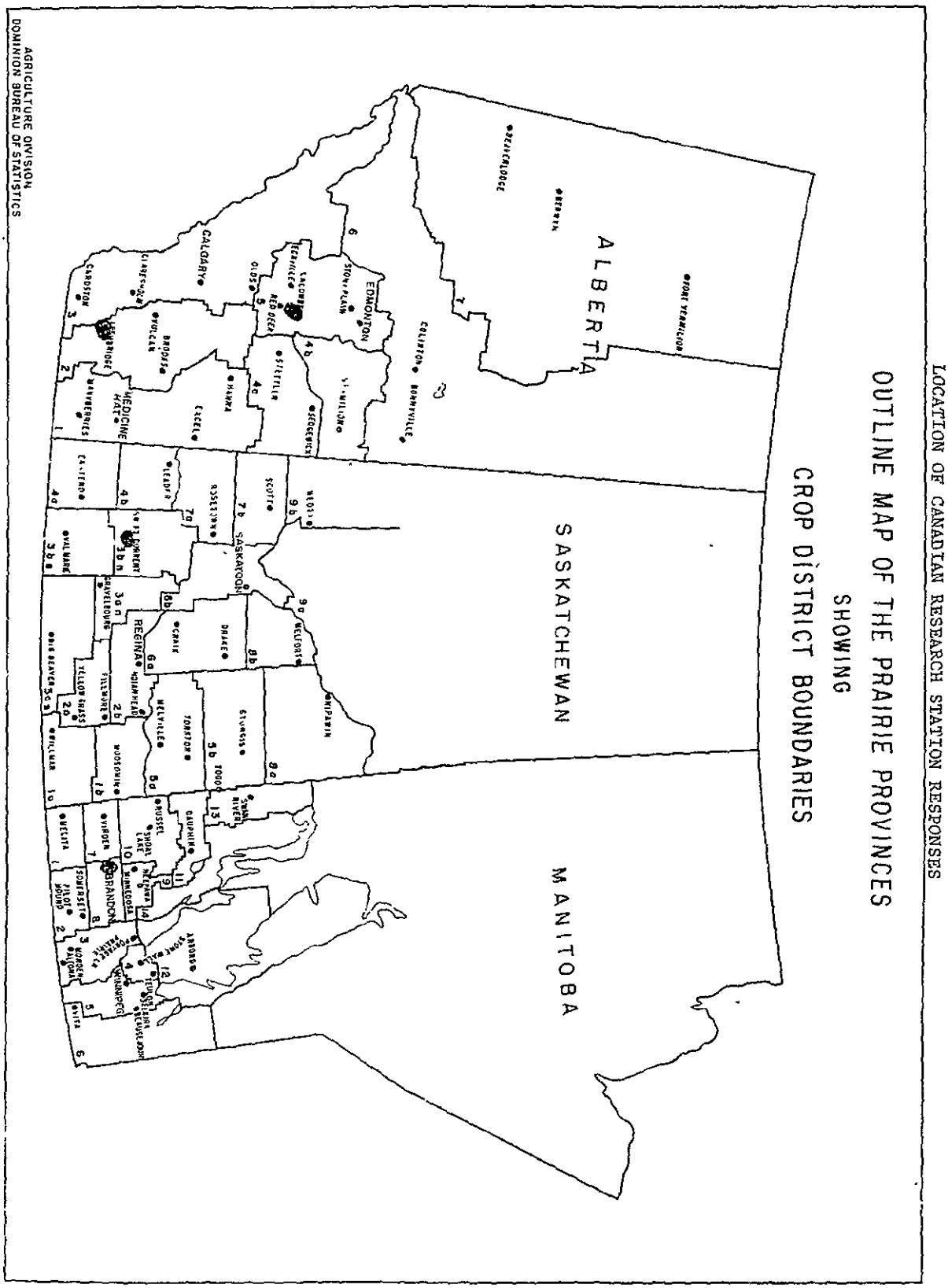
APPENDIX A

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Productions metric quintals (000)
MANITOBA						
Group-1	66.8	25.9	1,731.6	27.0	16.2	439.8
Group-2	13.2	27.9	368.4	5.3	17.5	93.6
Province	80.0	26.2	2,100.0	32.4	16.4	533.4
SASKATCHEWAN						
Group-1	150.5	18.4	2,762.8	61.0	11.5	701.8
Group-2	16.2	21.1	342.1	6.6	13.2	86.9
Group-3	93.3	17.1	1,595.1	37.8	10.7	405.2
Province	260.0	18.1	4,700.0	105.3	11.4	1,193.8
ALBERTA						
Group-1	166.2	24.1	4,003.0	67.3	15.1	1,016.8
Group-2	27.7	21.4	593.0	11.2	13.4	150.6
Group-3	6.1	17.0	104.0	2.5	10.7	26.4
Provinces	200.0	23.5	4,700.0	81.0	14.7	1,193.8
3-PRAIRIE Provinces	540.0	21.3	11,500.0	218.7	13.4	292.1

REGION II FALL RYE--1973

Province	Acres (000)	Yield bushels	Production bushels (000)	Hectares (000)	Yield metric quintals per hectare	Production metric quintals (000)
MANITOBA						
Group-1	66.1	26.2	1,731.6	26.8	16.4	439.8
Group-2	13.9	26.5	368.4	5.6	16.6	93.6
Province	80.0	26.3	2,100.0	32.4	16.5	533.4
SASKATCHEWAN						
Group-1	143.6	18.6	2,666.4	58.2	11.7	677.3
Group-2	19.1	22.0	420.7	7.7	13.8	106.9
Group-3	77.3	19.6	1,512.9	31.3	12.3	384.3
Province	240.0	19.2	4,600.0	97.2	12.0	1,168.4
ALBERTA						
Group-1	182.4	25.0	4,561.2	73.9	15.7	1,158.5
Group-2	31.4	22.4	703.6	12.7	14.0	178.7
Group-3	6.2	21.8	135.2	2.5	13.7	34.3
Province	220.0	24.5	5,400.0	89.1	15.4	1,371.6
3-PRAIRIE Provinces	540.0	22.4	12,100.0	218.7	14.0	3,073.4

LOCATION OF CANADIAN RESEARCH STATION RESPONSES



APPENDIX B

UNITED STATES DEPARTMENT OF AGRICULTURE
STATISTICAL REPORTING SERVICE
WASHINGTON, D C. 20250

July 3, 1974

In a recent visit with Statistics Canada, they suggested your experience and knowledge would be a great asset to our study. We are gathering agricultural information such as crop distribution maps, crop production statistics, cropping practices for selected areas and developing "Crop Calendars" for the National Aeronautics and Space Administration (NASA). This information will be used by them in a remote sensing research project to inventory wheat. It will therefore minimize the amount of ground verified information (ground truth) needed to analyze and utilize the remotely sensed data. The three Prairie Provinces of Canada were included to cover the hard red spring and durum wheat regions.

We feel your expertise can be of considerable value to us in the following areas:

1. Where grains are summer fallowed, how many times is the area cultivated?

   a. What are the approximate dates when this cultivation occurs?

2. What are the more common cropping systems for wheat, barley, oats, and rye in your area, i.e., summer fallow, stubble mulch, etc.

3. Is there any appreciable way of differentiating between the cereal grain plants by color, i.e., different shades of green during the heading stage? This would be helpful as a possible identification scheme from the Earth Resources Technology Satellite (ERTS) imagery that NASA is using.

4. What are the average number of days between biological stages of development for wheat, barley, oats and rye, i.e., planting to full coverage of ground, full coverage of ground to heading and flowering, heading and flowering to harvest?

5. Are there any dot distribution maps for the four commodities mentioned in 3. for your area or province? These could be based on acreage or production.

6. If there are any Research station publications on the above mentioned topics, these would be appreciated.

We would appreciate receiving any information you might have by July 17, 1974.

Thanking you in advance I am

M R Stuckey

M. R. STUCKEY, Head
Reports & Records Section
Data Services Branch, SD, SRS
U. S. Department of Agriculture
14th & Independence Ave., S. W.
Room 0234 South Building
Washington, D. C. 20250

Statistics Canada Statistique Canada

Ottawa K1A 0L7

December 27, 1973.

Mr. M. R. Stuckey, Head,
Reports and Records Section,
Data Services Branch, SD,
Statistical Reporting Service,
United States Department of
Agriculture,
Washington, D. C., 20250,
U. S. A.

Dear Mr. Stuckey:

In response to your letter dated December 13, 1973, please find enclosed four tables showing crop calendars for spring wheat, barley, oats and fall rye, and a map of the three Prairie Provinces indicating location of crop districts within each province. Crop districts have been aggregated within each province for tabulation purposes as crop conditions tend to be fairly homogeneous within these groupings. Also enclosed are copies of five questionnaires sent to the Prairie Provinces with specific questions relating to seeding, heading, and threshing dates.

This information is not available in any publication released by Statistics Canada. Hence, the data was compiled using a combination of subject-matter knowledge and experience and frequency distributions of seeding, heading, and threshing dates acquired from responses to our questionnaires. To the extent possible, the information has been discussed and confirmed with the Provincial Statisticians in the respective provinces. Since the data represent only estimates on the part of economists in our Crops Section, the data should not be considered as official Statistics Canada estimates. However, if you wish, you are most welcome to visit our office and study more rigorously the information we have on file.

Two points should be brought to your attention before you use the data. Firstly, the harvesting period has been defined as that time span within which ninety per cent of threshing is completed.

Mr. M. R. Stuckey Dec. 27, 1973.

This would not, of course, account for the cutting or swathing activity performed before threshing. If cutting were to be included, we would recommend that the beginning date be advanced by approximately ten days. Secondly, it is difficult to provide dates for seed-bed preparation since the majority of wheat in Western Canada is seeded on land that has been summerfallowed the previous season. This summerfallow, as well as stubble, is worked immediately before seeding or alternatively, in the same operation. Oats, barley and fall rye are mostly seeded on stubble, and the preparation would also be immediately before or in the same operation as the seeding activity. Because of the unusual nature of the seed-bed preparation and post-harvesting operations, we have deleted these columns in the enclosed tables.

If we can be of any further assistance, please do not hesitate to contact us.

Yours very truly,

W. L. Forteous, Director,
AGRICULTURE DIVISION.

attach. 4

Agriculture Canada

APPENDIX B

Your file Votre référence

Our file Notre référence 667/U.S.A.

Mr. M. R. Stuckey, Head,
Reports & Records Section,
Data Services Branch, SD, SRS,
U. S. Department of Agriculture,
14th & Independence Ave. S.W.,
Room 0234 South Building,
Washington, D. C. 20250

Research Station
Box 610
Brandon, Manitoba.
R7A 5Z7

Telephone 728-7234
(Area Code 204)

July 10, 1974

Dear Mr. Stuckey:

I have been asked to reply to your letter of July 3 which was addressed to Dr. W. N. MacNaughton, Director.

The following is our response to your several questions.

1. Approximately 4 - 5 times.

   a. Following seeding, approximately June first or a few days later, to the end of August, and occasionally one cultivation later to control certain troublesome weeds.

2. About 20 - 30% of South-Western Manitoba crop land is in summerfallow. A couple of common rotations are: 1) wheat, barley, fallow; 2) fallow, rapeseed, cereal.

3. Fields, of course, change colour as the plants on them pass through the various stages of growth to maturity and harvest.

   Most bread wheat acreage is planted to varieties or cultivars that do not have awns, however, one variety having awns, Napayo, has recently been licenced for sale and recommended in Manitoba, especially in the eastern portions of the crop land. It and a new awned feed wheat, Norquay, may comprise a significant portion of the land sown to wheat over the next few years in this area. Durum wheat in Western Canada is awned.

   Oats should be whiter in colour than the wheats and barley a yellower shade as it ripens.

   Unfortunately there is considerable difference within species as to the shade of green of the crops before heading, due in part to the amount and configuration of surface wax.

July 10, 1974

Mr. M. R. Stuckey

4. The early stages vary considerably with planting date and drought stress. The later seeded crops move through the pre-heading stages faster than the early ones.

An approximate time scale for the spring cereals could be:

Seeding to emergence	May 10 - 18	8 days
Emergence to full ground coverage	May 18 - June 2	15 days
Full ground cover to heading	June 2 - July 7	35 days
Heading to swathing	July 7 - Aug. 10	33 days
		91

Seeding occurs from late April through the second week in June. In most years the major portion of the seeding is done during the last three weeks of May.

The only winter cereal of any significant acreage is fall rye, comprising a few hundred thousand acres on the Canadian prairies as a whole.

5. Three sources of dot distribution maps showing the four commodities you listed are the following:

1) Weir, T. R. & Matthews 1971 Atlas of the Prairie Provinces. Toronto Oxford University Press. Limited edition - 500 copies. T. R. Weir, Head, Dept. of Geography, University of Manitoba, Winnipeg, Canada.

2) Weir, T. R. Editor 1960 Economic Atlas of Manitoba. Stovel-Advocate Press Ltd., Winnipeg, Manitoba, Canada.

3) Richards, J. H. & H. I. Fung 1969. Atlas of Saskatchewan, Univ. of Saskatchewan Publ., Saskatoon, Saskatchewan, Canada.

6. None to my knowledge, however the Manitoba Yearbook of Agriculture has longterm crop acreage statistics, currently unavailable, some sheets enclosed.

I hope the above answers your questions adequately.

Yours sincerely,

R. I. Wolfe,
Biologist, Barley Breeding.

RIW:rt

Agriculture
Canada

Area code: 403
Tel. No. 782-3316

Research Branch
Research Station
Lacombe, Alberta
TOC ISO

Your file Votre reference

Our file Notre reference

10 July 1974

Mr. M. R. Stuckey
Data Services Branch, SD, SRS
U. S. Department of Agriculture
Room 0234, 14th & Independence Ave. S.W.
Washington, D. C. 20250, U. S. A.

Dear Mr. Stuckey:

I have your letter of July 3 to Mr. Gillespie regarding agricultural information to assist in the development of crop production, maps, etc.

We, unfortunately, are just out of the hard red spring and durum wheat region.

In reply to your questions, 1) our major crop is barley. Very little of the land is fallowed (less than 10%) but when fallow is made, operations begin mid-May and are carried out at monthly intervals until October. 2) The most common cropping system is barley, and barley after barley for periods of six to twelve years. Approximately half of the farms do go into some rotation with perennial forage crops such as oats. Rapeseed is used to some extent as an alternate cash crop. Most of the crop is seeded on stubble.

Mr. M. R. Stuckey 10 July 1974

3) Wheat is usually darker green at heading than barley; rapeseed is yellow at flower time. These colour differences might be used by ERTS. 4) The average number of days from emergence to ground cover is 20-25 days; emergence to heading is 40-45 days, and emergence to harvest is 80-100 days. 5) I believe there are dot distribution maps for the commodities in three available from Alberta Department of Agriculture. 6) Perhaps the best information source on the varieties of topics you are interested in would be the Alberta Guide to Farm Practice. This publication has just been revised but reprints should be available this fall.

Thank you for your interest.

Yours very truly,

H. A. FRIESEN
Head, Crop Management & Soils Section

HAF/dib

APPENDIX B

Agriculture Canada

RESEARCH BRANCH

Soil Science Section
Research Station
Lethbridge, Alberta, Canada
T1J 4B1

Dr. M. R. Stuckey, Head
Reports and Records Section
Data Services Branch, SD, SRS
U. S. Department of Agriculture
14th and Independence Ave. S.W.
Room 0234 South
Washington, D.C. 20250
U. S. A.

Your file / Votre reference

Our file / Notre reference 667.2A

July 12, 1974

Dear Dr. Stuckey:

Mr. P. E. Blakeley asked me to reply to your letter of July 3 regarding ground-truth information.

As you may know, we are one of the centers presently ground-truthing for the ERTS program on hard red spring and durum wheat. Our 1973 data are currently being assessed by Dr. A. R. Mack and his staff in Ottawa, and 1974 ground-truth information is being forwarded as it is collected.

With reference to your specific questions: Fallows are generally cultivated or tilled about six or seven times between harvest in August or September of year 1 until they are seeded in the spring of year 3. During the normal fallow period of year 2, most dryland soils will be worked three to five times, depending on the presence and prevalence of weed growth. In southern Alberta, some farmers will cultivate wheat and barley stubble with subsurface cultivators in the fall immediately after harvest. This operation leaves most of the stubble standing erect, and the only visible sign of tillage is the kerf mark of the cultivator.

Spring tillage of land to be fallowed often precedes seedbed preparation of lands to be cropped and so may be initiated any time from about April 15 to May 15. Subsequent tillage on fallow is done at about 3- to 4-week intervals. We recommend that, in southern Alberta, farmers refrain from working fallows during August to discourage cutworm moths from laying eggs into the loose, pulverized surface of newly worked soils.

Throughout most of the dryland areas, cereal crops are grown under a crop-fallow or a crop-crop-fallow system. However, where spring soil moisture is plentiful, recropping on a more or less continuous basis is not uncommon. Hard red spring wheat and barley are the most common crops grown on dryland but we also have appreciable acreages of winter wheat, fall rye, durum wheat, and rape. Some oats are planted in mid-July to provide green cover crop during fall months.

Dr. M. R. Stuckey

Color differences in cereal crops can be deceiving because they are often governed or affected by soil fertility and available moisture. However, seedling oat crops are usually more blue-green than the deep, dark green of a good wheat or barley crop. Shortly after heading, barley crops will be lighter in color than most wheat crops at the same growth stage since most barleys are awned and our hard red spring wheats are awnless. Winter wheats have awns but they will normally be headed about 3 weeks before spring-planted grains are headed.

I have no meaningful data on average number of days between stages of growth for the various cereals on dryland. Stages of growth and development are so dependent on weather. However, the enclosed publication provides this information for wheat grown on irrigated land in southern Alberta.

The percentages of the various varieties of cereal grains and oilseeds grown in Alberta are shown on the enclosed charts, which were compiled by the Alberta Wheat Pool.

Yours sincerely,

U. J. Pittman

U. J. Pittman
Research Scientist

UJP/mm
encls

Observed and Estimated Evapotranspiration in Southern Alberta

APPENDIX B

E. H. Hobbs and K. K. Krogman
MEMBER ASAE

IRRIGATION was practiced in southern Alberta before 1900. As early as 1913, experiments were instituted to determine the consumptive use of water by crops. These early studies, conducted at a number of localities and at various times, were concerned primarily with seasonal water requirements. Irrigations were frequently scheduled on a calendar basis rather than as a function of soil moisture depletion. Recent studies (5, 7)* have emphasized the within-season requirements of different crops as influenced by stage of crop development, and soil moisture stress. These studies have also related measured evapotranspiration (hereinafter referred to as E_t) to various meteorological parameters observed concurrently (4). The relationships permit estimation of E_t for irrigation scheduling and provide a method by which the data may be made applicable to other areas of the prairies. Thus, the laborious and time-consuming task of measuring E_t in each locality can be eliminated.

This paper presents E_t for five crops. These data were determined from 1960 to 1966 by the plot method at the irrigation substation at Vauxhall, Alta. The data are compared with potential evapotranspiration (E_{tp}) calculated by procedures involving solar radiation and temperature. The transfer value of the data based on these E_t/E_{tp} ratios is discussed.

Approach

The soil on the plot areas is an Orthic Brown Chernozem representative of much of the irrigated area of southern Alberta. It is a sandy clay loam of alluvial lacustrine origin overlying slowly permeable glacial till at a depth of 3 to 4 ft. The water table, indicated by observation wells spaced throughout the area, was about 8 ft and rose only slightly during the growing season. Soil moisture, determined to a depth of 5 ft in the alfalfa plots and 4 ft for all other crops, did not indicate any appreciable amount of percolation through the subsoil. Consequently, the soil moisture depletion techniques used were believed to provide a good measure of E_t. During those periods when foliage provided full ground cover, the crops were assumed to be transpiring at the potential rate.

Most crops were irrigated when the soil moisture in the root zone was depleted to 50 percent of that readily available. For potatoes the allowable moisture depletion before irrigation was only 25 percent. These soil moisture levels had been previously determined to be the minimum permissible without limiting crop production (5). Soil moisture for E_t calculation was determined gravimetrically. Irrigation scheduling was based on soil moisture tension. Irrigation water was measured onto each plot in quantities sufficient to restore moisture in the root zone to field capacity. Temperatures and hours of sunshine were measured at a site adjacent to the plot area.

E_t was determined by adding precipitation and irrigation to the change in soil moisture occurring between sampling dates. All precipitation was considered effective unless it was in excess of that required to restore the soil profile to field capacity. The periods between soil moisture determinations usually coincided with periods between irrigations and varied from several weeks early in the season to 6 or 7 days during midsummer. The number of observations of E_t for each crop varied, depending on the number of years each crop was studied and the number of measurement periods each year. For the grass, 25 observations were made over a 5-year period; for alfalfa, 26 observations were made over a 3-year period, and for each of the row crops, there were about 60 sets of data. Best-fit polynomial regression equations and standard errors were obtained by computer calculation. The curves were plotted to present daily E_t as a function of days of growth and to show the relationship between measured E_t and calculated E_{tp} throughout the growing season. Calendar days were chosen for the abscissa instead of a biological time scale since crop-growth stages occurred on about the same calendar date each year. This may not apply in areas where a longer growing season permits considerable latitude in planting dates.

Evapotranspiration Data

The daily water requirements of the two row crops, potatoes and sugar beets, were very similar in both amount and seasonal distribution (Fig. 1). Peak rates approaching 0.25 in. per day occurred from mid-July to mid-August. This peak was reached at or shortly before the time that foliage completely shaded the ground between plants and between the rows. Planting dates and initial growth rates for the two crops were similar. After mid-August, water requirements declined more sharply for potatoes than for sugar beets because the potato vines were approaching maturity but sugar beets continued vigorous growth.

The two perennial forages, grass and alfalfa, were also much alike in water-use patterns. Their water requirements early in the season were higher than those of the row crops. After the row crops were fully developed, however, all four crops exhibited similar use patterns for the remainder of their active growth periods. Although the daily requirements of alfalfa appear to be higher than those of pasture grass, this may be partially due to different methods of calculating E_t. The grass curve was drawn from data representing the full time-interval in five interharvest periods in each of 5 years. The alfalfa use curve was calculated from E_t data that omitted a 7 to 10-day period immediately following each cutting. During these after-harvest periods when foliage was small, daily use by alfalfa was reduced to one-tenth of an inch per day. The alfalfa curve consequently represents E_{tp} for that crop while the curve for pasture grass contains some time intervals during which E_t may have been less than potential. However, since clipping height for the grass was comparatively high (3 in.), these periods of reduced E_t were undoubtedly short.

The daily E_t for cereals as represented by soft wheat differed from both row crops and forages. Early in the season daily use increased rapidly. A short but high-peak water requirement occurred in midseason and was fol-

Paper No. 67-238 presented at the Annual Meeting of the American Society of Agricultural Engineers meeting jointly with the Canadian Society of Agricultural Engineering at Saskatoon, Sask., Canada, June 1967, on a program arranged by the Soil and Water Division.

The authors—E. H. HOBBS and K. K. KROGMAN—are agricultural engineer and soil specialist, soil science section, Canada Department of Agriculture, research station, Lethbridge, Alberta, Canada.

* Numbers in parentheses refer to the appended references.

This article is reprinted from the TRANSACTIONS of the ASAE (vol. 11, no. 4, pp. 502, 503 and 507, 1968), the Transactions of the American Society of Agricultural Engineers, Saint Joseph, Michigan

lowed by a rapid decline beginning at the time of complete kernel formation. This sharp decline is characteristic of crops that are harvested when the foliage is dry and the plants are fully mature. It is distinctly different from the gradual seasonal decline of crops that maintain vegetative growth until harvest.

The standard deviations, ranging from 10 to 13 percent of the average daily water use, were primarily the result of differences between years caused by weather fluctuations. They suggest the range that may be encountered in defining average monthly and seasonal water requirements. The differences among crops, however, were influenced by the smaller number of observations for the forages as compared with the row crops. The average daily water requirements of the crops reported in this study are comparable to those reported from several locations in the western United States (2).

Calculated Potential Evapotranspiration

Since water requirements of crops are related to weather parameters, it is possible to predict E_{tp} from weather data. Numerous equations have been developed for this purpose. The procedure adopted in this study was that developed by Jensen and Haise (6) for estimating E_{tp}: $E_{tp} = (0.014T - 0.37)\ R_s$, in which R_s is solar radiation in inches per day and T is the mean temperature in degrees Fahrenheit. Measured radiation data were not available for the location at which the experiments were conducted. They were calculated using the coefficients developed by Fritz and MacDonald (8) and employed by Jensen and Haise. This expression is $R_s = R_{so}\ (0.35 + 0.61S)$, where R_{so} represents solar radiation on cloudless days and S is the percentage of maximum hours of sunshine occurring for the time interval at the location in question. The ratio of measured E_t and calculated E_{tp} would be unity provided that the measured value was derived from crops that were transpiring at the potential rate and for which incoming advected energy was not a significant factor.

Baier and Robertson (1), using data from Edmonton and Ottawa, derived a slightly different equation for estimating radiation. Their percent sunshine coefficient (0.616) was almost identical to that developed by Fritz and MacDonald (8) but the constant, 0.251, was 10 percent lower. Use of this equation would result in a lower radiation estimate, a lower estimate of E_{tp}, and a higher E_t/E_{tp} ratio, all in the order of 10 percent. The effect of the use of the Baier and Robertson equation rather than that of Fritz and MacDonald on the curves presented here would generally be to increase the ratios to a value greater than unity during the periods of maximum growth. For the row crops and cereals it would extend somewhat the length of time that a 1:1 ratio would apply. The E_t data reported here were determined under carefully controlled experimental procedures and are believed to represent accurate measurements of E_{tp}. Since the calculated values were more nearly equal to the measured values when the Fritz and MacDonald equation was employed, it is suggested that, where it is necessary to estimate radiation this equation be used.

E_t/E_{tp} Ratios

The E_t/E_{tp} ratio for sugar beets and potatoes (Fig. 2) approached unity as these crops developed full foliage and remained so until harvest. The ratio for forage crops was about unity for all of the growing season. Throughout May and much of June the daily rate of water use for forages, although not maximum, was about twice that of the annual crops. During the same time the E_t/E_{tp} ratio for the annual crops was much less than unity. Thus, early in the growing season meteorological environment limited E_t from the forages, but crop factors such as foliar development and plant spacing, as well as meteorological environment, limited E_t from the annual crops. When all crops reached full vegetative state, the E_t/E_{tp} ratios were all near unity. The ratio for soft wheat was a maximum during the active growth period between shot blade and early kernel formation. In late July and August, however, the ratio decreased rapidly from unity because the ripening and desiccation process at this stage of plant growth caused a drastic decline

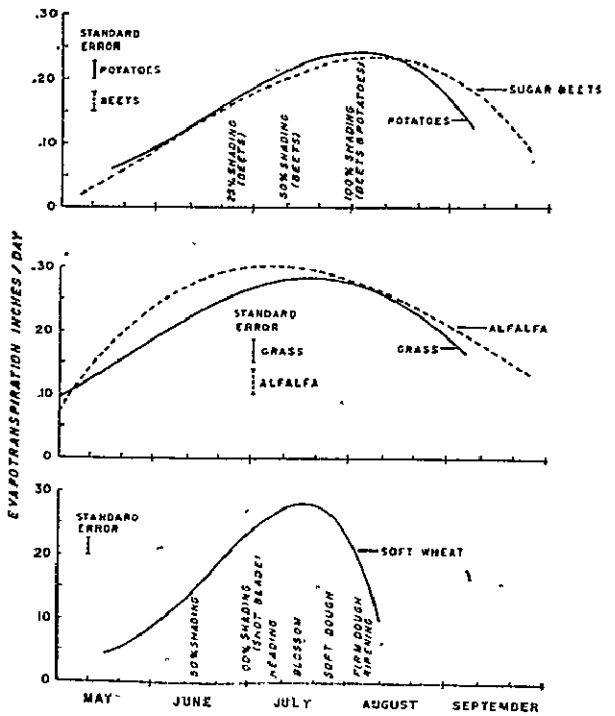


FIG. 1. Daily rates of water use for five irrigated crops in southern Alberta.

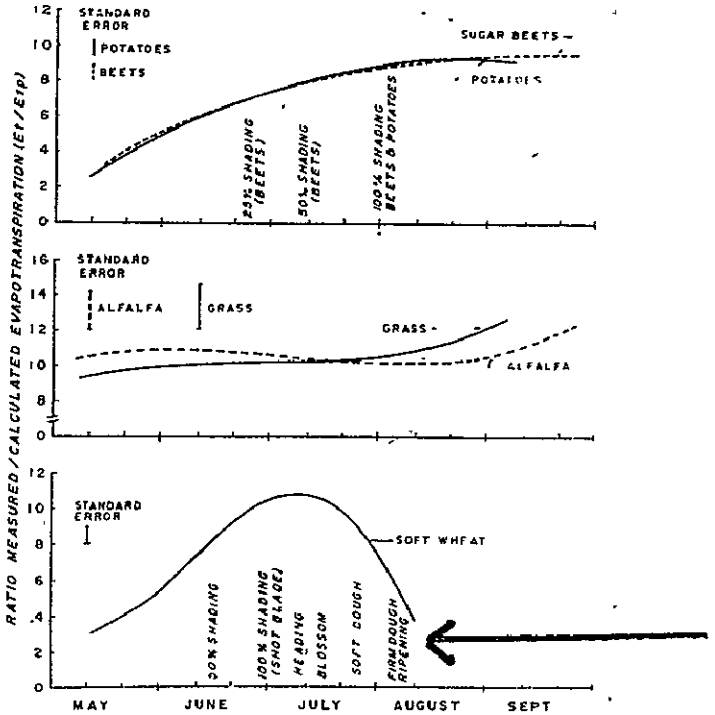


FIG. 2 Ratio of measured evapotranspiration to calculated potential evapotranspiration for five irrigated crops in southern Alberta.

in E_t. This decrease with approaching maturity was also apparent for potatoes.

Other methods of estimating E_t have been investigated by the authors (3) None of these has provided continuous within-season estimates of E_t that did not require the use of frequently changing parameters and the initial field determination of E_t. A radiation-type procedure such as the one used here apears more practical, however. After the crop approaches full foliar development, water requirements can be directly estimated until such time as there is a distinct change in growth habit. This procedure appears to apply to all commonly grown irrigated crops. It provides a much more uniform base for estimation of water requirements than does a daily-rate curve, which varies between crops and is not constant throughout the season for any of them. For slowly developing spring-seeded crops, ratios of less than unity would have to be applied to E_{tp} to calculate actual E_t. A percent ground-cover factor might be incorporated in the basic equation to reduce the ratio until the crop was transpiring at the potential rate.

There is a striking similarity of the ratio curves in this study to those of Jensen and Haise†. The general curve shapes for forages, cereals, and row crops are similar, and the E_t/E_{tp} ratios are approximately the same at equivalent stages of crop development. These results strongly support the contention that this method provides a practical basis for making information determined in one area applicable to another.

† Private communication relative to unpublished data.

APPENDIX B

References

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2 Blaney, Harry F. and Criddle, Wayne D. Determining consumptive use and irrigation water requirements. Tech. Bul. 1275, USDA Agr. Res Service, Washington, D.C., 1962.

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6 Jensen, Marvin E. and Haise, Howard R Estimating evaporation from solar radiation. Jour. Irrig. and Drainage Div., Proc. Amer. Soc. Civil Eng., pp 15-41, 1963.

7 Krogman, K. K. and Hobbs, E. H. Evapotranspiration by irrigated alfalfa as related to season and growth stage. Can. Jour. Plant Sci. 45:309-313, 1965.

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ALBERTA WHEAT POOL

APPENDIX B

VARIETY SURVEY

District Summary 1 As At June 8, 1974

District	WHEAT													DURUM							OATS									
	Canthatch	Chinook	Glenlea	Manitou	Neepawa	Park	Pitic 62	Saunders	Selkirk	Thatcher	Soft White Spring	Winter	Others	Hercules	Pelissier	Ramsay	Stewart 63	Wakooma	Wascana	Others	Fraser	Garry	Grizzly	Harmon	Random	Rodney	Sioux	Victory	Others
1	9	29		5	30	1	1			16	3	3	3	4	27	1	46	1	18	3		5		10	3	52	15	11	4
2	5	9	2	6	32	1	2			14	18	9	2	24	3	1	24	7	37	4	5	5	5	12	1	44	14	13	2
3	3	2	2	10	20	23				6	6	27	1	46			24	1	27	2			16	27	5	36	5	7	4
4	11	4	1	14	34	5	2	1		26			2	18	13		35	2	32		1	3	11	21	2	14	12	34	2
5	9	3	3	5	27	18	2			30		1	2	55		1	15	7	20	2	3	8	6	42	5	15	4	13	4
6	2	2	1	5	10	54	2	3	1	16		3	1	100							4	13	8	14	6	33	5	12	5
7	11		2	6	42	7	2			29			1	52			18	23	5	2	12	3	14	30	6	7	7	12	9
8	2			2	16	50	1		2	22			5								2	4	8	13	21	17	2	5	28
10	10		1	7	29	20				32			1	50			50				10	3	18	25	6	7	1	19	11
11	7		4		19	39	2		2	19			8								8	5	11	23	23	6		8	16
12	14		1		40	9				34			2								4	2	40	11	6	7	1	22	7
13	3		1	7	18	37		2	11	15			6								1	7	23	29	14	7		12	7
15	1		1	3	40	17		11		24	1		2									3	29	6	18	15		18	11
TOTAL	8.0	6.1	1.4	6.7	30.9	12.2	1.4	.8	.3	23.1	3.7	3.4	2.0	27.7	9.1	.5	29.5	4.4	26.1	2.7	5.7	4.9	15.2	21.5	9.5	15.0	3.8	14.6	9.8
LAST YEAR	9.8	4.7	X	8.7	21.2	12.8	X	1.7	.6	31.7	X	3.4	5.4	41.0	8.6	1.9	36.9	X	X	10.3	7.3	7.9	14.3	22.5	6.2	18.5	4.5	X	18.6

Agriculture Canada

RESEARCH STATION
SWIFT CURRENT, SASK.
S9H 3X2

Your file Votre référence

Our file Notre référence 630/FU5

Mr. M. R. Stuckey, Head,
Reports & Records Section,
Data Services Branch, SD, SRS,
U. S. Department of Agriculture,
14th & Independence Ave., S.W.,
Room 0234 South Building,
WASHINGTON, D.C. U. S. A. 20250

July 17, 1974.

Dear Mr. Stuckey:

We have your enquiry of July 3 relative to Agricultural information on crop statistics,etc. We will attempt to answer your questions point by point as follows:

1. Where grains are fallowed the practice is to cultivate when maximum weed growth occurs. Under our conditions in Southern Saskatchewan, this means 3 to 4 cultivations during the 21-month fallow period. Dates of cultivation are approximately June 1, July 5, August 10, September 15.
2. Wheat is our major crop and it is grown primarily in a Fallow-wheat or Fallow-wheat-wheat system. On occasion barley and oats alternate with wheat in a three-year rotation including fallow. On the sandy soils Fall rye is grown in a Fallow-rye system or may be included in rotation with wheat.
3. Durum wheat can usually be distinguished from the non-bearded spring wheats so these could probably be distinguished by color differences. However, our cereal breeders and others in your country are developing new bearded feed and utility wheats which may complicate this picture when these crops have occupied a substantial acreage. Barley is usually a paler green in color so it should be distinguishable from wheat in this area. We would expect rye also to appear somewhat different to these crops from the air particularly since this crop will head well ahead of the spring seeded crops.
4. The number of days between biological stages of development for wheat are approximately as follows: planting to full coverage of ground 37-45; full coverage of ground to heading 15-18; and heading to harvest 40-43 days.
5. We are not aware of any dot distribution maps for these crops on a provincial basis.

Dr. A. R. Mack, Soils Research Institute, Research Branch, Ottawa, Ontario has been involved in coordinating remote sensing studies in Canada. He would be in a position to give you an insight into their results across the prairies.

One of our co-workers here has been collecting data on crop stages in relation to flight passes but unfortunately he is absent from the station. However, when he returns we will discuss crop stages with him and forward any further data he has accumulated which we feel may be of use to you.

Yours very truly,

C. H. ANDERSON,
Senior Research Scientist
Head: Cereal Production and Utilization.

CHA/at

APPENDIX C

CANADA: Summary of Replies from Research Stations

1. Number of Days	Brandon, Manitoba	Lacombe, Alberta	Lethbridge, Alberta	Swift Current, Saskatchewan
Seeding to Emergence	8	N/A		
Emergence to Full ground Coverage	15	20-25	N/A	37-45
Full ground Coverage to Heading	35	20-25	N/A	15-18
Heading to Swathing	35	40-50	N/A	40-43
	91	80-100	N/A	92-106

2. Dates of Summer Fallow (SF) Cultivation:

June 1 thru August	May 15 thru September	April 15 thru July	June 1 thru September 15

3. Number of Cultivations on Summer Fallowed Land:

4 - 5	5	6 - 7	3 - 4

4. % of Land in SF:

20 - 30	10	N/A	N/A

N/A = No answer.

Average Height of Wheat (inches), 1973

District	June				July				August	
	9	16	23	30	7	14	21	28	4	11
1	4	7	10	14	16	21	23	23	23	24
2	5	7	10	12	16	19	22	23	24	24
3	3	5	8	9	13	14	18	21	23	26
4	3	5	6	10	13	19	23	26	27	29
5	3	5	7	10	14	19	24	28	29	30
6	3	5	7	9	12	18	21	25	28	31
7	3	5	7	9	13	18	23	27	30	31
8	3	5	7	10	14	20	23	28	31	33
10	3	5	7	11	15	19	24	27	35	34
11	4	5	8	11	14	20	23	25	33	31
12	3	6	8	11	14	18	23	27	31	32
13	4	6	8	11	13	18	22	25	27	32
15	3	5	7	10	14	18	22	26	29	33
TOTAL	3	5	8	11	14	19	22	25	28	30
LAST YEAR	4	6	8	11	14	18	*	25	28	30

Source: Alberta Wheat Pool Crop Reports, 1973

* Data Not Available.

ALBERTA, CANADA

Wheat, Percentage Seeded, By Districts, 1973

District	May				June
	5	12	19	26	2
1	20	51	85	95	100
2	9	27	64	88	94
3	0	6	36	77	95
4	0	12	58	88	99
5	0	7	42	89	99
6	0	2	37	74	96
7	0	2	25	84	98
8	0	0	35	83	97
10	0	2	38	87	98
11	0	8	58	95	100
12	0	2	44	87	99
13	0	8	66	82	96
15	0	0	40	85	96
Total	3	13	49	87	97
Last year	8	21	56	85	98

Source: Alberta Wheat Pool Crop Reports 1-5 inclusive, 1973.

ALBERTA, CANADA

Wheat, Percent Cutting Completed, by District, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	67	80	96	100								
2	34	67	89	95	99	99	100					
3	45	68	87	95	99	100						
4	6	29	49	70	90	96	98	100				
5	5	21	32	66	86	97	99	100				
6	0	5	27	65	78	98	98	100				
7	0	1	12	50	73	89	97	99	100			
8	0	1	10	32	61	89	98	100				
10	0	1	8	47	72	90	96	99	100			
11	0	7	18	60	73	92	93	95	99	99	99	99
12	0	2	11	51	80	93	96	97	97	97	98	98
13	0	1	12	44	62	79	87	94	96	96	96	96
15	0	1	7	27	29	61	61	65	78	90	90	90
Total	15	28	41	66	81	84	95	97	98	99	99	99
Last year	9	17	36	61	82	87	89	97	98	99	No report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

ALBERTA, CANADA

Wheat, Percent Threshing Completed, By District, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	20	55	77	95	98	99	99	100				
2	15	38	63	77	82	90	93	98	100			
3	27	43	55	73	82	93	99	100				
4	0	6	11	20	45	69	76	88	97	100		
5	1	4	6	19	29	58	68	81	98	100		
6	0	1	2	6	9	26	26	38	82	99	100	
7	0	0	0	8	19	42	45	61	83	97	100	
8	0	0	0	1	3	13	24	35	68	99	100	
10	0	0	0	4	14	19	22	24	68	70	70	70
11	0	0	4	5	9	16	16	21	21	39	45	45
12	0	0	0	4	10	14	19	19	19	26	26	26
13	0	0	0	1	3	7	9	11	12	16	16	16
15	0	0	0	0	1	5	8	13	24	33	39	39
Total	5	14	21	31	40	54	59	66	81	86	87	87
Last year	2	5	17	27	35	37	38	59	79	93	No report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

APPENDIX D

ALBERTA, CANADA

Oats, Percentage Seeded, By Districts, 1973

District	May				June
	5	12	19	26	2
1	14	44	83	92	98
2	9	28	53	79	93
3	0	5	29	74	92
4	0	14	51	77	94
5	1	4	33	79	96
6	0	4	20	57	85
7	0	1	11	47	82
8	0	0	9	44	78
10	0	0	5	35	75
11	0	1	19	60	89
12	0	0	7	42	76
13	0	2	19	60	78
15	0	0	11	56	83
Total	1	4	19	54	84
Last year	2	5	19	43	80

Source: Alberta Wheat Pool Crop Reports 1-5 inclusive, 1973.

APPENDIX D

ALBERTA, CANADA

Oats, Percent Cutting Completed, By District, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	74	89	97	100								
2	35	68	88	96	98	100						
3	37	62	86	96	99	100						
4	5	40	62	78	92	97	99	100				
5	14	37	53	84	92	99	100					
6	11	23	34	69	81	98	99	100				
7	1	7	23	60	76	93	99	100				
8	2	3	10	35	62	85	96	99	100			
10	0	2	7	36	59	85	95	99	100			
11	0	3	9	48	62	86	95	98	99	99	100	
12	0	1	8	38	63	85	91	96	96	96	98	98
13	0	0	9	47	65	82	87	95	96	96	96	96
15	0	2	12	31	47	77	80	85	90	95	95	95
Total	7	15	26	55	61	90	95	98	99	99	99	99
Last year	4	10	25	49	76	82	86	97	98	100	No Report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

ALBERTA, CANADA

Oats, Percent Threshing Completed, by Districts, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	47	78	89	98	99	100						
2	23	46	66	80	88	94	96	100				
3	7	23	59	76	91	99	100					
4	0	17	22	42	62	76	86	94	98	100		
5	10	19	26	47	60	81	91	96	100			
6	4	8	10	25	28	57	57	70	93	99	100	
7	1	1	6	21	35	56	67	80	94	99	100	
8	0	0	0	4	13	27	45	70	86	100		
10	0	0	0	7	13	26	32	46	60	74	83	83
11	0	0	6	7	9	23	37	45	45	67	73	73
12	0	0	0	6	15	31	42	45	53	57	66	66
13	0	0	0	4	13	25	31	42	43	49	53	53
15	0	0	1	2	9	23	28	40	50	57	59	59
Total	3	7	12	21	31	46	54	64	74	82	86	86
Last year	2	4	11	18	26	29	30	60	78	93	No Report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

ALBERTA, CANADA

Barley, Percentage Seeded, By Districts, 1973

District	May				June
	5	12	19	26	2
1	23	51	85	95	99
2	13	30	65	86	95
3	0	5	36	76	92
4	0	15	53	79	96
5	0	7	36	84	95
6	0	1	18	56	84
7	0	1	13	52	84
8	0	0	7	32	72
10	0	0	6	37	73
11	0	0	13	52	75
12	0	0	11	42	72
13	0	1	18	45	68
15	0	0	9	45	73
Total	1	4	15	53	79
Last year	4	8	25	47	78

Source: Alberta Wheat Pool Crop Reports 1-5 inclusive, 1973.

ALBERTA, CANADA

Barley, Percent Cutting Completed, By District, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	73	89	98	100								
2	48	75	92	97	99	100						
3	42	71	90	97	99	100						
4	15	49	73	87	95	99	100					
5	20	46	67	89	97	99	100					
6	8	29	47	75	87	97	100					
7	5	11	38	72	89	98	99	100				
8	1	7	21	54	74	89	97	99	100			
10	2	8	20	67	84	94	98	100				
11	6	15	31	71	80	95	97	97	99	99	100	
12	3	7	16	62	83	91	95	96	96	96	98	98
13	3	12	24	64	76	89	89	94	97	97	97	97
15	3	8	28	59	73	91	91	91	96	98	98	98
Total	11	23	40	71	84	94	97	98	99	99	99	99
Last year	7	14	39	60	84	88	90	97	98	99	No Report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

APPENDIX D

ALBERTA, CANADA

Barley, Percent Threshing Completed, By Districts, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	43	72	91	99	100							
2	28	53	76	84	91	95	97	99	100			
3	5	26	63	79	90	95	99	100				
4	5	17	27	47	70	85	92	95	99	100		
5	8	19	29	54	69	87	92	96	100			
6	1	6	13	26	29	60	60	72	92	99	100	
7	1	2	8	30	52	71	74	81	94	99	100	
8	0	1	3	14	24	42	54	71	86	97	100	
10	0	1	2	17	33	42	46	49	58	72	77	77
11	0	2	7	20	30	42	46	50	50	66	70	70
12	0	1	2	19	31	36	49	49	49	57	60	60
13	0	1	1	13	24	35	35	39	39	45	45	45
15	1	1	5	13	25	44	48	55	62	71	71	71
Total	4	9	16	30	42	56	61	67	74	82	84	84
Last year	2	4	13	24	33	36	36	60	73	90	No Report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

ALBERTA, CANADA

Spring Rye, Percentage Seeded, By Districts, 1973

District	May				June
	5	12	19	26	2
1	0	14	57	100	100
2	6	18	27	60	94
3	0	0	7	53	100
4	0	28	64	93	100
5	0	1	25	90	92
6	0	1	26	58	90
7	0	3	29	68	99
8	0	0	10	50	75
10	0	0	0	38	100
11	0	90	100	100	100
12	*	*	*	*	100
13	0	0	100	100	100
15	0	0	10	58	93
Total	1	11	36	76	95
Last year	8	21	34	47	82

* Report not available.

Source: Alberta Wheat Pool Crop Reports 1-5 inclusive, 1973.

ALBERTA, CANADA

Rye, Percent Cutting Completed, By District, 1973

District	Aug.		Sept.			
	18	25	1	8	15	22
1	99	100				
2	100					
3	90	92	94	95	99	100
4	38	83	93	97	99	99
5	91	96	98	98	98	100
6	58	66	89	95	100	
7	54	64	89	100		
8	53	73	82	97	100	
10	6	68	84	100		
11	26	19	57	57	100	
12	18	50	55	100		
13	0	40	62	88	100	
15	21	42	47	71	75	100
Total	71	86	93	97	99	100
Last year	57	77	92	95	99	99

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

APPENDIX D

ALBERTA, CANADA

Rye, Percent Threshing Completed, By Districts, 1973

District	Aug.		Sept.					Oct.				Nov.
	18	25	1	8	15	22	29	6	13	20	27	3
1	98	100										
2	92	97	98	100								
3	79	88	91	92	96	100						
4	13	52	61	75	93	97	98	99	100			
5	68	83	90	91	97	97	100					
6	15	47	70	72	77	83	83	84	92	100		
7	22	37	63	88	95	98	99	100				
8	2	30	42	81	90	92	93	95	99	100		
10	0	32	32	51	80	80	85	87	92	95	95	95
11	0	0	0	0	57	93	93	100				
12	0	43	43	100								
13	0	0	20	22	70	74	80	82	84	84	84	84
15	0	1	9	14	25	48	52	53	75	76	76	76
Total	52	68	78	85	93	95	96	97	98	99	99	99
Last year	36	55	80	86	90	92	92	96	97	99	No Report	

Source: Alberta Wheat Pool Crop Reports 16-27 inclusive, 1973.

REGION I Table 1. ALL WHEAT -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield: M. quintals per Hectare	Production Metric Quintals
TEXAS						
1-N	1,442,600	25.4	38,268,500	584,253	17.1	10,414,964
1-S	77,100	26.2	2,068,650	31,226	17.6	562,993
2-N 21	388,400	20.7	8,677,200	157,302	13.9	2,316,543
2-S 22	369,200	19.0	7,029,050	149,526	12.8	1,912,991
3	203,500	21.0	4,760,300	82,418	14.1	1,295,539
4	258,000	22.3	5,775,600	104,490	15.0	1,571,858
5-N	1,400	21.5	25,850	567	14.4	7,035
5-S	400	17.7	5,750	162	11.9	1,565
6	10,500	36.4	372,000	4,253	24.5	101,242
7	75,000	16.1	1,029,700	30,375	10.8	280,238
8-N	29,700	20.3	563,850	12,029	13.6	153,455
8-S	300	17.7	5,750	122	11.9	1,565
9	1,000	16.7	14,300	405	11.2	3,892
10-N	10,700	25.0	245,700	4,334	16.8	66,868
10-S	1,200	11.8	13,800	486	7.9	3,756
TOTAL	2,869,000	23.3	68,856,000	1/ 1,161,945	15.7	1/ 18,739,505
OKLAHOMA						
1	700,000	19.7	15,161,000	283,500	13.2	4,126,142
4	660,000	22.7	18,156,000	267,300	15.3	4,941,246
7	807,000	23.3	21,911,000	326,835	15.7	5,963,188
2	1,438,000	28.0	44,010,000	582,390	18.8	11,977,542
5	534,000	27.0	16,455,000	216,270	18.1	4,478,311
8	51,500	25.2	1,381,000	20,858	16.9	375,846
3	143,000	30.9	4,300,000	57,915	20.8	1,170,267
6	13,500	27.7	339,000	5,468	18.6	92,261
9	3,000	28.4	87,000	1,215	19.1	23,677
TOTAL	4,350,000	25.0	121,800,000	1,761,750	16.8	1/ 33,148,479
KANSAS						
1	1,065,000	33.0	30,980,000	431,325	22.2	8,431,362
4	1,102,000	32.2	33,429,000	446,310	21.6	9,097,869
7	1,624,000	32.3	52,188,000	657,720	21.7	14,203,225
2	1,175,000	35.7	39,413,000	475,875	24.0	10,726,445
5	1,561,000	31.0	45,225,000	632,205	20.8	12,308,210
8	2,251,000	32.5	72,460,000	911,655	21.8	19,720,351
3	263,000	35.8	8,149,000	106,515	24.1	2,217,791
6	294,000	32.5	8,301,000	119,070	21.8	2,259,159
9	514,000	33.7	15,174,000	208,170	22.6	4,129,680
TOTAL	9,849,000	32.8	305,319,000	3,988,845	22.0	83,094,092
NEBRASKA						
1	715,000	33.6	18,458,620	289,575	22.6	5,023,606
2	14,000	28.0	321,810	5,670	18.8	87,582
3	18,000	34.5	632,130	7,290	23.2	172,037
5	121,000	36.0	3,809,860	49,005	24.2	1,036,872
6	324,000	40.0	12,017,560	131,220	26.9	3,270,639
7	610,000	36.4	19,142,180	247,050	24.5	5,209,640
8	343,000	39.6	11,714,640	138,915	26.6	3,188,198
9	505,000	39.0	17,378,200	204,525	26.2	4,729,564
TOTAL	2,650,000	37.0	83,475,000	1,073,250	24.9	1/22,718,139
REGIONAL TOTAL	19,718,000	23.3	579,450,000	7,985,790	15.7	157,700,215

REGION II TABLE I ALL WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 average yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals	Production metric quintals
NORTH DAKOTA						
1	1,266,000	28.7	40,184,900	512,730	19.3	10,936,521
2	838,700	28.1	25,354,100	339,674	18.9	6,900,245
3	1,311,500	33.0	44,380,400	531,158	22.2	12,078,348
4	642,700	25.7	17,782,200	260,294	17.3	4,839,515
5	676,400	29.9	20,807,300	273,942	20.1	5,662,811
6	620,600	32.6	20,119,600	251,343	21.9	5,475,650
7	659,400	24.5	15,757,600	267,057	16.5	4,288,510
8	459,600	22.5	10,617,800	186,138	15.1	2,889,687
9	513,100	27.2	13,356,100	207,806	18.3	3,634,929
TOTAL	6,988,000	28.8	208,360,000	1/2,830,140	19.4	56,706,216
SOUTH DAKOTA						
1	282,100	22.6	6,320,600	114,261	15.2	1,720,183
2	627,000	23.4	12,439,500	253,935	15.7	3,385,472
3	232,130	26.8	5,340,890	94,013	18.0	1,453,550
4	165,740	30.5	4,257,700	67,125	20.5	1,158,754
5	269,240	24.1	6,021,550	109,042	16.2	1,638,795
6	33,250	23.2	741,770	13,466	15.6	201,876
7	67,360	27.2	1,263,920	27,281	18.3	343,982
8	214,020	28.5	5,513,800	86,678	19.2	1,500,608
9	30,160	25.0	701,270	12,215	16.8	190,854
TOTAL	1,921,000	25.0	42,601,000	1/778,005	16.8	1/11,594,075
MONTANA						
1	53,200	37.9	1,951,000	21,546	25.5	530,974
2	1,496,000	26.5	37,744,900	605,880	17.8	10,272,463
3	1,272,000	24.7	36,436,300	515,160	16.6	9,916,321
5	406,300	24.6	9,438,500	164,552	16.5	2,568,735
7	77,100	35.7	3,059,000	31,226	24.0	832,522
8	226,400	26.7	5,786,200	91,692	17.9	1,574,743
9	219,000	25.0	5,338,100	88,695	16.8	1,452,791
TOTAL	3,750,000	25.9	99,754,000	1/1,518,750	17.4	1/27,148,550
REGIONAL TOTAL	12,659,000	27.4	350,715,000	5,126,895	18.4	95,448,841

1/ May not add due to rounding.

REGION III TABLE I ALL WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric Quintals	Production metric Quintals
WASHINGTON						
1	2,800	59.6	147,400	1,134	40.1	40,116
2	240,600	26.8	4,927,200	97,443	18.0	1,340,962
3	135,200	53.0	6,601,900	54,756	35.6	1,769,740
5	1,175,800	37.4	35,993,100	476,199	25.1	9,795,702
9	757,600	57.3	41,010,400	306,828	38.5	11,161,185
TOTAL	2,312,000	43.5	88,680,000	936,360	29.2	24,134,705
OREGON						
1	81,600	55.0	4,421,500	33,048	37.0	1,203,333
2	376,300	33.1	11,472,500	152,402	22.2	3,122,298
3	256,400	46.3	11,176,000	103,842	31.1	3,041,604
7	3,400	46.8	152,300	1,377	31.4	41,449
8	54,300	44.0	2,279,700	21,992	29.6	620,432
TOTAL	772,000	41.0	29,502,000	1/312,660	27.6	1/8,029,117
IDAHO						
1	273,000	60.2	15,450,000	110,565	40.5	4,204,795
7	57,000	60.7	2,828,000	23,085	40.8	769,654
8	130,000	56.3	6,427,000	52,650	37.8	1,749,140
9	562,000	38.0	19,961,000	227,610	25.5	5,432,486
TOTAL	1,022,000	47.6	44,666,000	413,910	32.0	12,156,075
REGIONAL TOTAL	4,106,000	44.0	162,848,000	1,662,930	29.6	44,319,897

1/ May not add due to rounding.

REGION IV Table 1. ALL WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 Ave. Yield Bushels	Production bushels	Hectares	1969-71 Ave. Yield metric Quintals per hectare	Production metric Quintals
OHIO						
1	255,300	30.9	10,582,000	103,396	20.8	2,879,944
2	176,000	36.8	6,209,000	71,280	24.7	1,689,810
3	60,300	33.6	2,042,000	24,422	22.6	555,741
4	169,300	42.6	6,747,000	68,566	28.6	1,836,230
5	195,700	38.1	7,330,000	79,258	25.6	1,994,896
6	25,000	32.2	819,000	10,125	21.6	222,895
7	83,700	39.7	3,204,000	33,898	26.7	871,985
8	37,900	32.9	1,269,000	15,350	22.1	345,365
9	13,800	30.5	444,000	5,589	20.5	120,837
TOTAL	1,017,000	39.2	38,646,000	1/411,885	26.3	1/10,517,702
ILLINOIS						
1	12,000	38.0	469,700	4,860	25.5	127,831
2	32,600	40.0	1,376,800	13,203	26.9	374,703
3	85,000	34.9	3,108,300	34,425	23.5	845,939
4	89,000	41.3	4,033,900	36,045	27.8	1,097,846
5	81,000	45.2	3,879,900	32,805	30.4	1,055,934
6	257,400	39.8	9,943,000	104,247	26.7	2,706,037
7	323,000	41.0	12,643,400	130,815	27.6	3,440,965
8	239,000	39.2	8,001,300	96,795	26.3	2,177,594
9	154,000	37.1	4,917,700	62,370	24.9	1,338,377
TOTAL	1,273,000	39.7	48,374,000	515,565	26.7	13,165,226
INDIANA						
1	85,400	41.4	3,609,900	34,587	27.8	982,452
2	109,100	26.6	4,273,900	44,186	17.9	1,163,163
3	124,300	39.7	4,760,600	50,342	26.7	1,295,621
4	98,700	24.7	4,152,400	39,974	16.6	1,130,096
5	163,000	27.0	7,079,400	66,015	18.1	1,926,694
6	71,200	42.0	2,793,100	28,836	28.2	760,156
7	151,300	39.5	5,814,500	61,276	26.5	1,582,445
8	32,800	36.6	1,146,800	13,284	24.6	312,107
9	34,200	36.3	1,169,400	13,851	24.4	318,258
TOTAL	870,000	41.0	34,800,000	1/352,350	27.6	1/9,470,994
REGIONAL TOTAL	39,643,000	30.6	1,214,833,000	16,055,415	20.6	330,622,875
NATIONAL TOTAL						

1/ May not add due to rounding.

REGION I TABLE I-A WINTER WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectares	Production metric quintals
TEXAS						
1-N	1,442,600	25.4	38,268,500	584,253	17.1	10,414,964
1-S	77,100	26.2	2,068,650	31,226	17.6	562,993
2-N	388,400	20.7	8,667,200	157,302	13.9	2,358,822
2-S	369,200	18.9	7,029,050	149,526	12.7	1,912,991
3	203,500	20.9	4,760,300	82,418	14.0	1,295,539
4	258,000	22.3	5,775,600	104,490	15.0	1,571,858
5-N	1,400	21.5	25,850	567	14.4	7,035
5-S	400	17.6	5,750	162	11.8	1,565
6	10,500	36.4	372,000	4,253	24.5	101,242
7	75,000	16.1	1,029,700	30,375	10.8	280,238
8-N	29,700	20.3	563,850	12,029	13.6	153,455
8-S	300	17.7	5,750	122	11.9	1,565
9	1,000	16.7	14,300	405	11.2	3,892
10-N	10,700	25.0	245,700	4,334	16.8	66,868
10-S	1,200	11.8	13,800	486	7.9	3,756
TOTAL	2,869,000	23.3	68,856,000	1,161,945	15.7	18,739,505
OKLAHOMA						
1	700,000	19.7	15,161,000	283,500	13.2	4,126,142
4	660,000	22.3	18,156,000	267,300	15.0	4,941,246
7	807,000	23.3	21,911,000	326,835	15.7	5,963,188
2	1,438,000	28.0	44,010,000	582,390	18.8	11,977,542
5	534,000	27.0	16,455,000	216,270	18.1	4,478,311
8	51,500	25.2	1,381,000	20,858	16.9	375,846
3	143,000	30.8	4,300,000	57,915	20.7	1,170,267
6	13,500	27.7	339,000	5,468	18.6	92,261
9	3,000	28.4	87,000	1,215	19.1	23,677
TOTAL	4,350,000	24.9	121,800,000	1,761,750	16.7	33,148,479
KANSAS						
1	1,065,000	33.2	30,980,000	431,325	22.3	8,191,321
24	1,102,000	32.2	33,429,000	446,310	21.6	9,097,869
37	1,624,000	32.3	52,188,000	657,720	21.7	14,203,225
42	1,175,000	35.7	39,413,000	475,875	24.0	10,726,445
55	1,561,000	31.0	45,225,000	632,205	20.8	12,308,210
68	2,251,000	32.5	72,460,000	911,655	21.8	19,720,351
73	263,000	35.8	8,149,000	106,515	24.1	2,217,791
86	294,000	32.5	8,301,000	119,070	21.8	2,259,159
99	514,000	33.7	15,174,000	208,170	22.6	4,129,680
TOTAL	9,849,000	32.8	305,319,000	3,988,845	22.0	83,094,092
NEBRASKA						
1	715,000	33.7	18,458,620	289,575	22.6	5,023,606
2	14,000	27.7	321,810	5,670	18.6	87,582
3	18,000	34.7	632,130	7,290	23.3	172,037
5	121,000	36.1	3,809,860	49,005	24.3	1,036,872
6	324,000	40.2	12,017,560	131,220	27.0	3,270,639
7	610,000	36.4	19,142,180	247,050	24.5	5,209,640
8	343,000	39.7	11,714,640	138,915	26.7	3,188,198
9	505,000	39.1	17,378,200	204,525	26.3	4,729,564
TOTAL	2,650,000	37.0	83,475,000	1,073,250	24.9	22,718,139
REGIONAL TOTAL	19,718,000	30.5	579,450,000	7,985,790	20.5	157,700,215

APPENDIX E

REGION II. TABLE I-A WINTER WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 av yield bushels	Production bushels	Hectares	1969-71 av yield metric quintals per hectares	Production metric quintals
N. DAKOTA						
1	3,000	26.1	73,900	1,215	17.5	20,112
2	700	25.6	18,100	284	17.2	4,926
3	1,500	32.9	49,400	608	22.1	13,444
4	18,400	25.5	468,200	7,452	17.1	127,423
5	1,400	27.1	40,300	567	18.2	10,968
6	2,600	28.8	74,600	1,053	19.4	20,303
7	50,700	27.1	1,242,600	20,534	18.2	338,180
8	7,100	23.8	164,800	2,876	16.0	44,851
9	2,600	26.2	68,100	1,053	17.6	18,534
TOTAL	88,000	26.6	2,200,000	35,640	17.9	598,741
S. DAKOTA						
1	55,300	24.8	1,238,900	22,397	16.7	337,173
2	33,500	28.3	842,200	13,568	19.0	229,209
3	4,130	28.1	111,290	1,673	18.9	30,288
4	150,700	31.7	3,971,800	61,034	21.3	1,080,945
5	120,400	28.0	3,032,900	48,762	18.8	825,419
6	2,060	27.4	58,120	834	18.4	15,818
7	66,200	27.2	1,243,300	26,811	18.3	338,370
8	201,300	29.1	5,297,300	81,527	19.6	1,441,687
9	9,140	32.4	279,190	3,811	21.8	75,983
TOTAL	643,000	28.7	16,075,000	260,415	19.3	4,374,892
MONTANA						
1	43,000	39.0	1,588,000	17,415	26.2	432,182
2	1,221,000	27.5	30,637,300	494,505	18.5	8,338,094
3	330,000	27.8	9,637,000	133,650	18.7	2,622,758
4	380,000	25.3	8,828,500	153,900	17.0	2,402,720
5	71,000	36.7	2,803,000	28,755	24.7	762,850
6	215,000	26.5	5,408,200	87,075	17.8	1,471,869
7	156,000	26.5	3,914,000	62,370,000	17.8	1,065,215
TOTAL	2,416,000	27.5	62,816,200	977,670	18.5	17,095,743
REGIONAL TOTAL	3,147,000	27.9	81,091,200	127,454	18.7	22,069,376

REGION III TABLE I-A WINTER WHEAT -- 1969 APPENDIX E

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectare	Production metric quintals
WASHINGTON						
1	2,200	61.7	128,100	891	41.5	34,863
2	222,800	14.0	4,477,100	90,234	9.4	1,218,465
3	132,400	53.2	6,529,000	53,622	35.7	1,776,900
5	1,000,000	38.3	32,426,200	405,000	25.7	8,824,952
9	754,600	66.4	40,919,600	305,613	44.6	11,136,474
TOTAL	2,112,000	44.2	84,480,000	855,360	29.7	22,991,654
OREGON						
1	74,500	55.6	4,168,000	30,173	37.4	1,134,342
2	365,300	33.3	11,198,000	147,947	22.4	3,047,592
3	249,400	47.3	10,977,500	101,007	31.8	2,987,582
7	3,200	32.5	147,000	1,296	21.8	40,007
8	39,600	44.3	1,691,500	16,038	29.8	460,350
TOTAL	732,000	41.3	28,182,000	296,460	27.8	7,669,872
IDAHO						
1	262,000	61.4	15,065,000	106,110	41.3	4,100,015
7	44,000	57.0	2,178,000	17,820	38.3	592,754
8	90,000	52.6	4,267,000	36,450	35.3	1,161,285
9	446,000	35.0	14,696,000	180,630	23.5	3,999,590
Total	842,000	46.3	36,206,000	341,010	31.1	9,853,644
REGIONAL TOTAL	3,686,000	44.0	148,868,000	1,492,830	29.6	40,515,171

REGION IV TABLE I-A WINTER WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectares	Production metric quintals
OHIO						
1	255,300	43.2	10,582,000	103,397	29.0	2,879,944
2	176,000	37.4	6,209,000	71,280	25.1	1,689,810
3	60,300	34.6	2,042,000	24,422	23.3	555,741
4	169,300	43.0	6,747,000	68,567	28.9	183,623
5	195,700	38.9	7,330,000	79,259	26.1	1,994,896
6	25,000	33.1	819,000	10,125	22.2	222,895
7	83,700	37.4	3,204,000	33,899	25.1	871,985
8	37,900	34.1	1,269,000	15,350	22.9	345,365
9	13,800	31.8	444,000	5,589	21.4	120,837
TOTAL	1,017,000	39.7	38,646,000	411,885	26.7	10,517,702
ILLINOIS						
1	12,000	38.2	469,700	4,860	25.7	127,831
2	32,600	40.9	1,376,800	13,203	27.5	374,703
3	85,000	35.2	3,108,300	34,425	23.7	845,939
4	89,000	41.6	4,033,900	36,045	28.0	1,097,846
5	81,000	45.9	3,879,900	32,805	30.8	1,055,934
6	257,400	40.4	9,943,000	104,247	27.1	2,706,037
7	323,000	41.3	12,643,400	130,815	27.8	3,440,965
8	239,000	39.5	8,001,300	96,795	26.5	2,177,594
9	154,000	37.2	4,917,700	62,370	25.0	1,338,377
TOTAL	1,273,000	39.8	48,374,000	515,565	26.7	13,165,226
INDIANA						
1	85,400	41.3	3,609,900	34,587	27.8	982,452
2	109,100	39.6	4,273,900	44,186	26.6	1,163,163
3	124,300	39.9	4,760,600	50,342	26.8	1,295,621
4	98,700	42.7	4,152,400	39,974	28.7	1,130,096
5	163,000	45.5	7,079,400	66,015	30.6	1,926,694
6	71,200	42.9	2,793,100	28,836	28.8	760,156
7	151,300	40.1	5,814,300	61,277	26.9	1,582,445
8	32,800	37.0	1,146,800	13,284	24.9	312,107
9	34,200	36.6	1,169,400	13,851	24.6	318,258
TOTAL	870,000	41.3	34,800,000	352,350	27.8	9,470,994
REGIONAL TOTAL	3,160,000	40.3	121,820,000	1,279,800	27.1	33,153,922
NATIONAL TOTALS	29,711,000	31.3	931,229,200	12,032,955	21.0	3,274,829
"U.S. TOTALS"	36,303,000	31.2	1,131,439	14,702,715	21.0	307,927

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectare	Production metric quintals
N DAKOTA						
1	628,000	26.9	18,591,000	254,340	18.1	5,059,634
2	288,000	26.1	8,220,000	116,640	17.5	2,183,227
3	557,000	33.6	18,915,000	225,585	22.6	5,147,812
4	446,000	24.5	11,348,000	180,630	16.5	3,088,415
5	359,000	29.5	10,384,000	145,395	19.8	2,826,058
6	435,000	32.8	14,244,000	176,175	22.0	3,876,576
7	555,000	24.2	13,133,000	224,775	16.3	3,574,212
8	413,000	22.4	9,411,000	167,265	15.1	2,561,251
9	339,000	27.3	8,512,000	137,295	18.3	2,316,583
TOTAL	4,020,000	28.0	112,560,000	1,628,100	18.8	30,633,768
S DAKOTA						
1	204,200	22.4	4,476,800	82,701	15.1	1,218,384
2	495,300	23.5	9,650,100	200,597	15.8	2,626,323
3	157,600	2711	3,603,600	63,828	18.2	980,738
4	13,700	21.0	246,100	5,549	14.1	66,977
5	131,700	21.5	2,595,100	53,339	14.4	706,269
6	25,470	22.9	554,700	10,315	15.4	150,964
7	990	18.7	16,600	401	12.6	4,518
8	11,320	18.5	187,700	4,585	12.4	51,083
9	19,720	21.8	399,300	7,987	14.6	108,590
TOTAL	1,060,000	23.5	21,730,000	429,300	15.8	5,913,928
MONTANA						
1	10,000	34.1	357,000	4,050	22.9	97,159
2	218,000	24.8	5,486,000	88,290	16.7	1,493,042
3	774,000	23.5	21,444,000	313,470	15.8	5,836,092
5	25,500	30.5	594,000	10,328	20.5	161,660
7	6,000	31.2	254,000	2,430	21.0	69,127
8	11,000	29.8	368,000	4,455	20.0	100,153
9	59,500	22.7	1,305,000	24,098	15.3	355,162
TOTAL	1,104,000	24.0	29,808,000	447,120	16.1	8,112,396
REGIONAL TOTAL	6,184,000	26.4	164,098,000	2,504,520	17.7	44,660,091

REGION III TABLE I-B SPRING WHEAT -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectare	Production metric quintals
WASHINGTON						
1	600	37.7	19,300	243	25.3	5,253
2	17,800	21.8	450,100	7,209	14.6	122,497
3	2,800	25.3	72,900	1,134	17.0	19,840
5	175,800	22.2	3,566,900	71,199	14.9	970,750
9	3,000	29.6	90,800	1,215	19.9	24,712
TOTAL	200,000	22.4	4,200,000	81,000	15.1	1,143,051
OREGON						
1	7,100	34.6	253,500	2,876	23.3	68,991
2	11,000	22.9	274,500	4,455	15.4	74,707
3	7,000	30.2	198,500	2,835	20.3	54,023
7	200	26.5	5,300	81	17.8	1,442
8	14,700	40.8	588,200	5,954	27.4	160,082
TOTAL	40,000	33.0	1,320,000	16,200	22.2	359,245
IDAHO						
1	11,000	38.6	385,000	4,455	25.9	104,780
7	13,000	54.2	650,000	5,265	36.4	176,901
8	40,000	58.0	2,160,000	16,200	39.0	587,855
9	116,000	45.5	5,265,000	46,980	30.6	1,432,896
TOTAL	180,000	48.5	8,460,000	72,900	32.6	2,302,431
REGIONAL TOTAL	420,000	39.4	13,980,000	170,100	26.5	3,804,727
NATIONAL TOTAL	6,604,000	27.0	178,078,000	2,674,620	18.1	48,464,818
U S TOTAL	7,423,000	27.3	202,837,000	3,006,315	18.3	55,203,104

APPENDIX E

REGION II TABLE I-C DURUM WHEAT -- 1969

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectares	Production metric quintals
N. DAKOTA						
1	635,000	31.1	21,520,000	257,175	20.9	5,856,776
2	550,000	28.1	17,314,000	222,750	18.9	4,712,092
3	753,000	30.7	25,416,000	304,965	20.6	6,917,091
4	178,300	29.6	5,966,000	72,212	19.9	1,623,677
5	316,000	29.5	10,383,000	127,980	19.8	2,825,785
6	183,000	30.2	5,801,000	74,115	20.3	1,578,771
7	53,700	24.7	1,382,000	21,749	16.6	376,118
8	39,500	22.5	1,042,000	15,998	15.1	283,586
9	171,500	25.7	4,776,000	69,458	17.3	1,299,812
TOTAL	2,880,000	29.6	93,600,000	1,166,400	19.9	25,473,708
S. DAKOTA						
1	22,600	22.9	604,900	9,153	15.4	164,627
2	98,200	19.6	1,947,200	39,771	13.2	529,940
3	70,400	22.9	1,626,000	28,512	15.4	442,524
4	1,340	24.0	39,800	543	16.1	10,832
5	17,140	21.7	393,550	6,942	14.6	107,107
6	5,720	21.2	128,950	2,317	14.2	35,094
7	170	20.1	4,020	69	13.5	1,094
8	1,400	20.1	28,800	567	13.5	7,838
9	1,030	21.6	22,780	417	14.5	6,200
TOTAL	218,000	21.4	4,796,000	88,290	14.4	1,305,255
MONTANA						
1	200	29.0	6,000	81	19.5	1,633
2	57,000	28.3	1,665,700	23,085	19.0	440,347
3	168,000	26.4	5,355,300	68,040	17.7	1,407,858
5	800	20.9	16,000	324	14.0	4,354
7	100	20.8	2,000	41	14.0	544
8	400	26.5	10,000	162	17.8	2,722
9	3,500	21.2	75,000	1,418	14.2	20,412
TOTAL	230,000	26.7	7,130,000	93,150	17.9	1,940,460
REGIONAL TOTAL	3,328,000	31.6	105,526,000	1,347,840	21.2	28,719,429
NATIONAL TOTAL	3,328,000	31.6	105,526,000	1,347,840	21.2	28,719,429
U.S. TOTALS	3,420,000	31.7	108,403,000	1,385,100	21.3	29,502,418

REGION I TABLE II ALL BARLEY--1969 APPENDIX E

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	23,500	26.2	798,200	9,518	14.1	173,784
1-S	1,000	25.2	25,700	405	13.5	5,595
2-N	26,200	31.2	997,000	10,611	16.8	217,067
2-S	11,000	30.0	320,500	4,455	16.1	69,779
3	11,100	26.0	379,590	4,496	14.0	82,625
4	13,000	26.9	392,500	5,265	14.5	85,455
5-N	--	--	--	--	--	--
5-S	250	16.4	4,750	101	8.8	1,034
6	13,000	47.8	716,100	5,265	25.7	155,909
7	12,000	24.6	304,300	4,860	13.2	66,252
8-N	1,100	17.8	19,750	446	9.6	4,300
8-S	--	--	--	--	--	--
9	200	23.8	4,750	81	12.8	1,034
10-N	1,650	17.4	26,950	668	9.4	5,868
10-S	--	--	--	--	--	--
TOTAL	114,000	35.0	3,990,000	46,170	18.8	868,703
OKLAHOMA						
1	16,900	24.9	550,200	6,845	13.4	119,790
4	68,000	29.5	2,375,400	27,540	15.9	517,172
7	91,600	32.8	3,221,600	37,098	17.6	701,407
2	205,400	37.2	7,717,100	83,187	20.0	1,680,167
5	116,300	32.7	4,044,300	47,102	17.6	880,525
8	2,900	34.7	106,000	1,175	18.7	23,078
3	22,800	36.8	849,800	9,234	19.8	150,140
6	900	29.4	27,600	365	15.8	6,009
9	200	37.9	8,000	81	20.4	1,742
TOTAL	525,000	36.0	18,900,000	212,625	19.4	4,114,908
KANSAS						
1	8,850	36.6	266,600	3,584	19.7	58,044
2	3,110	35.0	101,900	1,260	18.8	22,186
3	6,950	35.3	289,200	2,815	19.0	62,965
4	2,970	35.0	87,400	1,203	18.8	19,029
5	14,970	35.2	501,400	6,063	18.9	109,165
6	77,100	38.5	2,997,000	31,226	20.7	652,507
7	840	40.7	34,200	340	21.9	7,446
8	3,220	38.1	126,500	1,304	20.5	27,542
9	51,990	39.0	1,885,800	21,056	21.0	410,576
TOTAL	170,000	37.0	6,290,000	68,850	19.9	1,369,459
NEBRASKA						
1	21,000	37.7	722,100	10,611	20.3	191,719
2	3,600	32.6	99,050	932	17.5	13,126
3	3,600	35.3	134,000	1,175	19.0	23,427
5	1,000	31.5	29,900	486	16.9	8,643
6	2,000	34.0	63,400	972	18.3	16,732
7	5,500	38.5	198,100	2,555	20.7	53,722
8	800	35.3	27,900	324	19.0	6,244
9	2,500	32.6	85,550	1,175	17.5	19,497
TOTAL	40,000	34.0	1,360,000	16,200	18.3	296,099
REGIONAL TOTAL	849,000	36.0	30,540,000	343,845	19.4	6,649,169

REGION II TABLE II ALL BARLEY 1969 APPENDIX E

STATES AND CRD'S	Acres	1969-71 Av. yield bushels	Production bushels	Hectares	1969-71 Av. yield metric quintals per hectare	Production metric quintals
						1
N. DAKOTA						
1	157,000	39.7	6,649,000	63,585	21.3	1,447,620
2	193,000	38.0	7,552,000	78,165	20.4	1,644,221
3	665,000	41.4	27,771,000	269,325	22.3	6,046,302
4	71,000	36.6	2,805,000	28,755	19.7	610,705
5	224,000	40.0	9,108,000	90,720	21.5	1,982,994
6	498,000	43.3	22,703,000	201,690	23.3	4,942,897
7	77,000	35.7	2,969,000	31,185	19.2	646,411
8	67,000	32.5	2,370,000	27,135	17.5	515,996
9	220,000	41.5	9,327,000	89,100	22.3	2,030,674
TOTAL	2,172,000	42.0	91,224,000	879,660	22.6	19,861,289
S. DAKOTA						
1	31,900	35.5	1,225,600	12,920	19.1	266,838
2	95,900	39.3	3,384,400	38,840	21.1	736,852
3	79,600	39.2	3,033,700	32,238	21.1	660,497
4	20,500	29.0	556,100	8,303	15.6	121,074
5	33,500	34.0	1,106,600	13,568	18.3	240,929
6	34,200	40.3	1,423,500	13,851	21.7	309,924
7	8,500	30.0	214,500	3,443	16.1	46,701
8	25,700	27.6	626,900	10,409	14.8	136,489
9	14,200	34.9	468,700	5,751	18.8	102,045
TOTAL	344,000	35.0	12,040,000	139,320	18.8	2,621,349
MONTANA						
1	45,000	51.6	2,182,500	18,225	27.7	475,174
2	859,000	39.4	36,044,500	347,895	21.2	7,847,609
3	328,000	35.2	13,231,600	132,840	18.9	2,880,784
5	173,000	34.6	7,307,500	70,065	18.6	1,590,989
7	53,000	47.4	2,702,000	21,465	25.5	588,279
8	112,000	36.8	4,850,700	45,360	19.8	1,056,094
9	47,000	32.1	1,595,200	19,035	17.2	347,307
TOTAL	1,617,000	42.0	67,914,000	654,885	22.6	14,786,236
REGIONAL TOTAL	4,133,000	41.4	17,178,000	1,673,865	22.3	37,268,874

REGION III TABLE II ALL BARLEY--1969 APPENDIX E

STATES AND CRD'S	Acres	1969-71 Av. yield bushels	Production bushels	Hectares	1969-71 Av. yield metric quintals per hectare	Production metric quintals
WASHINGTON						
1	5,600	66.4	350,600	2,268	35.7	76,333
2	41,000	36.5	1,434,900	16,605	19.6	312,406
3	49,600	51.2	2,442,600	20,088	27.5	531,803
5	61,800	44.2	2,370,200	25,029	23.8	516,040
9	199,000	57.3	10,200,700	80,595	30.8	2,220,896
TOTAL	357,000	47.0	16,779,000	144,585	25.3	3,653,124
OREGON						
1	76,450	50.3	3,985,700	30,962	27.0	2,143,911
2	127,650	36.9	3,871,800	51,698	19.8	3,135,124
3	121,000	50.0	5,369,000	49,005	26.9	3,833,178
7	4,400	48.1	226,300	1,782	25.9	123,600
8	69,500	57.8	4,103,200	28,148	31.1	2,484,272
TOTAL	399,000	44.0	17,556,000	161,595	23.7	3,822,292
IDAHO						
1	147,000	53.6	7,277,000	59,535	28.8	1,584,348
7	61,000	68.7	4,148,000	24,705	36.9	903,103
8	89,000	69.2	5,963,000	36,045	37.2	1,298,264
9	356,000	50.1	17,874,000	144,180	26.9	3,891,527
TOTAL	653,000	54.0	35,262,000	264,465	29.0	7,677,243
REGIONAL TOTAL	1,409,000	49.4	69,597,000	570,645	26.6	15,152,659

REGION IV TABLE II ALL BARLEY--1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Av. yield bushels	Production bushels	Hectares	1969-71 Av. yield metric quintals per hectare	Production metric quintals
OHIO						
1	700	49.6	35,700	284	26.7	7,773
2	1,200	46.2	51,600	486	24.8	11,234
3	6,000	51.8	296,900	2,430	27.8	64,641
4	600	44.6	22,900	243	24.0	4,986
5	1,200	43.6	48,000	486	23.4	10,451
6	3,000	49.6	141,200	1,215	26.7	30,742
7	1,200	46.5	56,000	486	25.0	12,192
8	800	44.2	39,300	324	23.8	8,556
9	1,300	46.8	60,400	527	25.2	13,150
TOTAL	16,000	47.0	752,000	6,480	25.3	163,725
ILLINOIS						
1	1,100	47.9	51,100	446	25.8	11,125
2	3,300	48.3	156,800	1,337	26.0	34,138
3	1,100	42.1	42,300	446	22.6	9,209
4	400	49.4	20,200	162	26.6	4,398
5	400	47.8	21,000	162	25.7	4,572
6	1,000	48.0	45,500	405	25.8	9,906
7	600	44.3	23,000	244	23.8	5,008
8	3,400	45.2	130,600	1,377	24.3	28,434
9	700	44.0	25,500	284	23.7	5,552
TOTAL	12,000	43.0	516,000	4,860	23.1	112,344
INDIANA						
1	300	45.1	14,800	122	24.2	3,222
2	500	46.9	24,000	203	25.2	5,225
3	800	45.7	36,300	324	24.6	7,903
4	300	42.4	12,300	122	22.8	2,678
5	400	43.0	16,900	162	23.1	3,679
6	200	43.5	7,700	81	23.3	1,676
7	3,500	47.6	161,900	1,418	25.6	35,249
8	3,100	49.3	139,200	1,256	26.5	30,307
9	900	46.9	36,900	365	25.2	8,034
TOTAL	10,000	45.0	450,000	4,050	24.2	97,974
REGIONAL TOTAL	38,000	45.2	1,718,000	15,390	24.3	374,043
"NATIONAL TOTAL"	6,429,000	42.5	273,033,000	2,603,745	22.8	59,444,745
U. S. TOTAL	9,557,000	1/ 44.7	427,055,000	3,870,585	1/24.0	92,978,415

1/ 1969 YIELD ONLY.

REGION I TABLE III OATS -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	6,300	36.7	219,500	2,552	13.2	31,860
1-S	6,000	29.5	174,900	2,430	10.6	25,387
2-N	34,600	42.7	1,567,800	14,013	15.3	227,566
2-S	106,800	34.8	4,011,800	43,254	12.5	582,313
3	125,000	33.7	4,575,800	50,625	12.1	664,177
4	244,000	39.5	9,783,000	98,820	14.2	1,420,002
5-N	4,300	38.7	142,000	1,742	13.9	20,611
5-S	3,600	28.6	112,500	1,458	10.3	16,329
6	5,300	52.3	323,200	2,146	18.7	46,912
7	110,800	33.2	3,846,300	44,874	11.9	558,290
8-N	21,700	32.3	674,200	8,788	11.6	97,860
8-S	--	--	--	--	--	--
9	1,000	22.7	20,000	405	8.1	2,903
10-N	600	25.6	9,000	243	9.1	1,306
10-S	--	--	--	--	--	--
TOTAL	670,000	38.0	25,460,000	271,350	13.6	1/ 3,695,519
OKLAHOMA						
1	3,800	26.2	117,400	1,539	9.4	17,041
4	22,100	33.7	903,200	8,950	12.1	131,099
7	47,300	40.5	2,092,900	19,156	14.5	305,784
2	41,000	41.8	1,856,300	16,605	15.0	269,442
5	43,100	38.9	1,931,200	17,456	13.9	280,314
8	16,900	38.4	719,100	6,844	13.8	104,377
3	22,500	40.5	840,300	9,112	14.5	121,970
6	7,500	43.9	314,200	3,038	15.7	45,606
9	800	39.3	40,400	324	14.1	5,864
TOTAL	205,000	43.0	8,815,000	1/ 83,025	15.4	1,279,497
KANSAS						
1	8,850	38.1	318,800	3,584	13.7	46,274
2	1,250	36.1	43,100	506	12.9	6,256
3	1,220	35.8	49,900	494	12.8	7,243
4	13,120	41.0	540,700	5,314	14.7	78,483
5	21,160	35.5	676,600	8,570	12.7	98,208
6	12,750	35.9	495,100	5,164	12.9	71,864
7	19,780	47.4	829,000	8,011	17.0	120,329
8	22,020	46.1	919,800	8,918	16.5	153,509
9	25,850	43.5	1,041,000	10,469	15.6	151,101
TOTAL	126,000	42.0	4,914,000	51,030	15.1	715,267
NEBRASKA						
1	90,810	43.9	3,875,210	36,778	15.7	562,487
2	34,270	34.7	901,250	13,879	12.4	130,816
3	301,770	46.5	13,286,670	122,217	16.7	1,928,560
5	18,030	38.3	645,460	7,302	13.7	93,689
6	62,220	49.4	3,247,080	25,199	17.7	471,314
7	25,640	45.2	1,090,260	10,384	16.2	158,251
8	6,910	45.7	309,600	2,799	16.4	44,938
9	21,350	49.0	1,048,470	8,647	17.6	152,185
TOTAL	561,000	43.5	24,404,000	227,205	15.6	1/ 3,542,241
REGIONAL TOTAL	1,562,000	40.7	63,593,000	632,610	14.6	9,230,524

1/ May not add due to rounding.

REGION II TABLE III OATS -- 1969

STATES AND CRD'S	Acres	1969-71 Av. yield bushels	Production bushels	Hectares	1969-71 Av. yield metric quintals per hectares	Production metric quintals
N. DAKOTA						
1	261,000	53.9	15,527,000	105,705	19.3	2,253,744
2	255,000	45.9	12,800,000	103,275	16.5	1,857,920
3	391,000	51.6	22,400,000	153,039	18.5	3,251,360
4	190,000	48.4	10,186,000	76,950	17.3	1,478,498
5	327,000	49.2	18,061,000	107,061	17.6	2,621,554
6	405,000	56.7	25,581,000	164,025	20.3	3,713,082
7	183,000	48.3	10,002,000	74,115	17.3	1,451,790
8	243,000	43.8	11,669,000	98,415	15.7	1,693,755
9	464,000	55.0	27,398,000	187,920	19.7	3,976,820
TOTAL	2,719,000	56.5	153,624,000	1,101,195	20.2	1/22,298,524
S. DAKOTA						
1	108,900	43.2	5,093,500	44,104	15.5	739,322
2	376,000	49.7	17,711,000	152,280	17.8	2,570,752
3	454,700	53.2	23,533,000	184,154	19.1	3,415,315
4	56,100	37.8	2,099,700	22,720	11.0	304,771
5	267,700	40.5	10,743,100	108,418	14.5	1,559,361
6	547,700	49.1	28,131,800	221,818	17.6	4,083,331
7	21,800	33.0	652,200	8,829	11.8	94,667
8	115,500	31.7	3,272,900	46,778	11.4	475,061
9	408,600	46.3	18,363,800	165,483	16.6	2,665,506
TOTAL	2,357,000	46.5	109,601,000	1/954,585	16.7	1/15,908,585
MONTANA						
1	10,000	51.5	556,000	4,050	18.5	80,703
2	82,500	44.0	3,649,000	33,412	15.8	529,652
3	155,000	45.6	8,059,000	62,775	16.3	1,169,764
5	32,300	38.6	1,468,800	13,082	13.8	213,196
7	13,700	53.5	822,000	5,548	19.2	119,313
8	25,000	46.3	1,362,500	10,125	16.6	197,767
9	37,500	39.9	1,704,700	15,188	14.3	247,437
TOTAL	356,000	44.3	17,622,000	144,180	15.9	1/2,557,833
REGIONAL TOTAL	5,432,000	38.4	280,847,000	2,199,960	13.8	764,942

1/ May not add due to rounding.

Data not available for Region III

REGION IV TABLE III OATS --1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Av. yield bushels	Production bushels	Hectares	1969-71 Av. yield metric quintals per hectares	Production metric quintals
OHIO						
1	142,900	67.1	9,764,000	57,874	24.0	1,417,245
2	86,700	63.7	5,091,000	35,114	22.8	738,959
3	78,700	57.2	4,605,000	31,874	20.5	668,416
4	121,500	66.7	8,025,000	49,208	23.9	1,164,829
5	81,900	57.4	4,834,000	33,170	20.6	701,655
6	31,500	52.1	1,730,000	12,758	18.7	251,110
7	23,000	52.4	1,304,300	9,315	18.8	189,319
8	7,700	42.3	375,200	3,118	15.2	54,460
9	11,100	45.9	541,500	4,496	16.5	78,599
TOTAL	585,000	61.3	36,270,000	1/236,925	22.0	1/5,264,592
ILLINOIS						
1	281,000	61.1	17,339,600	113,805	21.9	2,516,843
2	131,000	61.4	8,474,700	53,055	22.0	1,230,103
3	80,500	55.0	4,767,100	32,602	19.7	691,945
4	78,000	60.4	4,968,400	31,590	21.6	721,163
5	64,000	58.9	3,853,700	25,920	21.1	559,365
6	21,000	52.6	1,003,200	8,505	18.9	145,614
7	33,000	56.7	1,937,800	13,365	20.3	281,272
8	10,000	44.6	368,300	4,050	16.0	53,459
9	4,500	40.8	170,200	1,822	14.6	24,705
TOTAL	703,000	61.0	42,883,000	1/284,715	21.9	1/6,224,467
INDIANA						
1	34,100	62.1	2,231,200	13,810	22.3	323,859
2	41,900	56.5	2,449,300	16,970	20.2	355,516
3	81,300	61.6	5,068,200	32,926	22.1	735,649
4	28,700	58.1	1,718,600	11,624	20.8	249,455
5	58,200	60.7	3,555,600	23,571	21.8	516,095
6	47,200	59.3	2,671,000	19,116	21.3	387,696
7	8,700	48.6	408,800	3,524	17.4	59,337
8	10,100	49.0	471,300	4,090	17.6	68,409
9	9,800	44.5	466,000	3,969	15.9	67,640
TOTAL	320,000	59.5	19,040,000	129,600	21.3	2,763,656
REGIONAL TOTALS	1,608,000	47.6	98,193,000	651,240	17.1	1/14,252,715
"NATIONAL TOTAL"	8,571,000	51.1	440,727,000	3,471,255	18.3	1/63,971,526
U S TOTALS	17,971,000	2/53.7	965,863,000	7,278,255	2/19.2	140,195,014

1/ May not add due to rounding.
2/ 1969 yield only.

REGION I TABLE IV RYE--1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	10,950	18.3	241,500	4,435	11.5	58,115
1-S	8,400	14.3	166,000	3,402	9.0	39,954
2-N	8,100	12.8	125,100	3,281	8.0	30,099
2-S	2,400	15.1	34,800	972	9.5	8,382
3	2,200	16.5	44,600	891	10.4	10,744
4	3,900	15.0	67,500	1,580	9.4	16,231
5-N	300	13.2	4,400	122	8.3	1,067
5-S	--	--	--	--	--	--
6	--	--	--	--	--	--
7	900	15.7	13,600	356	9.8	3,277
8-N	100	15.0	1,100	41	9.4	254
8-S	--	--	--	--	--	--
9	700	23.2	22,200	284	14.6	5,334
10-N	50	22.0	1,200	20	13.8	279
10-S	--	--	--	--	--	--
TOTAL	38,000	15.7	722,000	15,390	9.8	173,736
KANSAS						
1	23,440	23.8	491,200	9,493	14.9	124,765
2	12,560	18.7	217,900	5,087	11.7	55,347
3	8,380	16.2	148,400	3,394	10.2	37,694
4	3,840	23.9	81,500	1,555	15.0	20,701
5	2,670	17.1	42,820	1,081	10.7	10,876
6	6,310	17.8	105,800	2,556	11.2	26,873
7	700	22.9	13,020	284	14.4	3,307
8	400	24.3	7,380	162	15.2	1,875
9	700	23.0	12,980	284	14.4	5,256
TOTAL	59,000	21.3	1,121,000	23,895	13.4	284,734
NEBRASKA						
1	64,300	27.7	1,213,710	26,042	17.4	308,282
2	8,000	16.1	115,280	3,240	10.0	29,281
3	27,000	19.2	463,670	10,935	12.0	117,772
4	4,200	25.5	92,520	1,701	16.0	23,500
5	3,200	25.9	70,620	1,296	16.2	17,937
6	26,000	25.1	558,100	10,530	15.7	141,757
7	1,600	23.5	35,040	648	14.8	8,900
8	700	27.6	16,060	284	17.3	4,079
9	--	--	--	--	--	--
TOTAL	135,000	25.1	2,565,000	54,675	15.7	651,510
REGIONAL TOTAL	232,000	22.9	4,370,000	93,960	14.4	1,109,980

APPENDIX E

REGION II TABLE IV RYE--1969

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectare	Production metric quintals
N. DAKOTA						
1	37,000	24.5	766,500	14,985	15.3	194,691
2	47,500	21.9	817,000	19,238	13.7	207,518
3	5,500	26.9	122,500	2,228	16.9	31,115
4	12,000	26.0	250,500	4,860	16.3	63,627
5	21,500	30.0	446,000	8,708	18.8	113,284
6	10,500	31.6	315,000	4,253	19.8	80,010
7	22,500	27.8	445,500	9,113	17.4	11,316
8	9,000	23.4	139,000	3,645	14.7	35,306
9	64,500	32.7	1,873,000	26,123	20.5	475,742
TOTAL	230,000	28.4	5,175,000	93,150	17.8	1,314,450
S. DAKOTA						
1	3,420	26.2	72,300	1,385	16.4	18,364
2	125,600	32.4	3,054,300	50,868	20.3	775,792
3	70,800	33.7	2,212,500	28,674	21.1	561,975
4	700	28.5	15,800	320	17.9	4,013
5	36,730	31.8	1,024,900	14,876	19.9	260,325
6	10,580	30.0	320,000	4,285	18.8	81,280
7	1,660	27.5	32,080	672	17.2	8,148
8	11,590	27.9	315,500	4,694	17.5	80,137
9	2,380	29.0	80,620	1,146	18.2	20,477
TOTAL	264,000	32.1	7,128,000	106,920	20.1	1,810,512
MONTANA						
1	100	18.5	2,500	41	11.6	635
2	2,900	26.3	64,800	1,175	16.5	16,459
3	3,900	18.3	74,100	1,580	11.5	18,821
5	200	23.8	4,800	81	14.9	1,219
7	100	18.0	1,800	41	11.3	457
8	200	27.8	7,200	81	17.4	1,829
9	600	17.6	12,800	243	11.0	3,251
TOTAL	8,000	21.4	168,000	3,240	13.4	1/42,672
REGIONAL TOTAL	502,000	30.3	12,471,000	203,310	19.0	3,167,634

1/ May not add due to rounding.

REGION IV TABLE IV RYE--1969

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
ILLINOIS						
1	2,000	22.4	50,600	810	14.0	12,852
2	700	24.7	22,900	284	15.5	5,817
3	1,300	20.2	28,400	526	12.7	7,214
4	9,200	24.7	214,400	3,726	15.5	54,458
5	1,100	22.1	31,100	446	13.9	7,899
6	2,800	21.0	55,500	1,134	13.2	14,097
7	3,100	22.5	84,500	1,256	14.1	21,463
8	2,200	21.6	51,300	891	13.5	13,030
9	1,600	20.2	37,300	648	12.7	9,474
TOTAL	24,000	22.8	576,000	1/9,720	14.3	146,304
"NATIONAL TOTALS"	758,000	27.5	17,417,000	306,990	17.2	4,423,918
U S TOTALS	1,291,000	2/23.4	30,204,000	5,228,550	2/14.7	7,671,816

1/ May not add due to rounding.
2/ 1969 yield only.

REGION I TABLE V CORN FOR GRAIN -- 1969

APPENDIX E

STATES AND CRD's	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	123,000	111.6	10,740,000	49,815	70.0	2,727,960
1-S	29,000	115.2	2,494,000	11,745	72.2	633,476
2-N	2,400	33.4	59,000	972	20.9	14,986
2-S	2,000	29.3	44,000	810	18.4	11,176
3	2,300	27.1	60,000	932	17.0	15,240
4	107,000	26.6	2,050,000	43,335	16.7	520,700
5-N	17,000	25.6	273,000	6,885	16.1	69,342
5-S	31,000	31.9	685,000	12,555	20.0	173,990
6						
7	9,800	17.1	527,000	3,969	10.7	133,858
8-N	178,000	37.8	5,658,000	72,090	23.7	1,437,132
8-S	1,500	45.7	71,000	608	28.7	18,034
9	45,000	39.5	1,360,000	18,225	24.8	345,440
10-N	27,000	50.8	1,082,000	10,935	31.9	274,828
10-S	22,000	66.1	1,165,000	8,910	41.5	295,910
TOTAL	597,000	44.0	26,268,000	1/241,785	27.6	6,672,072
OKLAHOMA						
1	22,400	104.8	1,751,200	9,072	65.7	444,805
4	1,200	49.0	49,900	486	30.7	12,675
7	1,000	52.7	56,300	405	33.1	14,300
2	2,800	47.1	166,400	1,134	29.5	42,266
5	4,800	34.1	158,300	1,944	21.4	40,208
8	9,300	41.0	338,400	3,766	25.7	85,954
3	12,100	42.6	447,300	4,900	26.7	113,614
6	7,500	37.7	224,200	3,038	23.6	56,947
9	900	32.0	32,000	364	20.1	8,128
TOTAL	62,000	52.0	3,224,000	1/25,110	32.6	1/818,896
KANSAS						
1	89,900	105.6	9,627,500	36,410	66.2	2,445,385
2	75,300	111.5	8,129,000	30,496	66.9	2,064,766
3	156,100	112.8	16,946,000	63,220	70.7	4,304,436
4	131,600	78.4	10,970,500	53,298	49.2	2,786,507
5	26,000	68.2	1,692,400	10,530	42.8	429,870
6	11,200	79.3	906,600	4,536	49.7	230,276
7	329,300	64.4	24,246,600	133,366	40.4	6,158,636
8	257,000	62.3	16,511,900	104,085	39.1	4,194,023
9	131,600	55.4	6,400,900	53,298	34.7	1,625,829
TOTAL	1,208,000	79.0	95,432,000	1/489,240	49.5	24,239,728
NEBRASKA						
1	71,000	87.2	5,380,080	28,755	54.7	1,366,540
2	181,000	75.2	14,224,570	73,305	47.2	3,613,041
3	1,197,000	63.5	91,980,400	484,785	39.8	23,363,022
5	589,000	96.7	59,076,100	238,545	54.4	15,005,329
6	1,354,300	88.7	138,249,650	548,492	55.6	35,115,411
7	242,700	85.6	21,441,150	98,294	53.6	5,446,052
8	394,000	110.8	45,670,700	159,570	69.5	11,600,358
9	591,000	92.1	58,257,350	239,355	57.7	14,797,367
TOTAL	4,620,000	94.0	434,280,000	1/1,871,100	59.0	110,307,120
REGIONAL TOTAL	6,487,000	86.2	559,204,000	2,627,235	54.1	142,037,816

1/ May not add due to rounding.

REGION II TABLE V CORN FOR GRAIN -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
S. DAKOTA						
1	13,000	56.7	801,000	5,265	35.6	203,454
2	236,000	38.0	10,037,500	95,580	23.8	2,549,525
3	272,000	48.0	13,704,000	110,160	30.1	3,480,816
4	5,000	32.9	190,800	2,025	20.6	48,463
5	221,800	33.0	7,980,700	89,829	20.7	2,027,098
6	708,000	50.5	41,453,000	286,740	31.7	10,529,062
7	5,000	70.4	327,000	2,025	44.2	83,058
8	59,200	25.0	1,423,000	23,976	15.7	361,442
9	826,000	52.5	53,113,000	334,530	32.9	13,490,702
TOTAL	2,346,000	55.0	129,030,000	950,130	34.5	32,773,620

REGION IV TABLE V CORN FOR GRAIN -- 1969

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectares	Production metric quintals
OHIO						
1	610,800	89.6	51,087,000	247,374	56.2	12,976,098
2	338,500	84.5	27,463,000	137,092	53.0	6,975,602
3	161,800	81.5	13,595,000	65,529	51.1	3,453,130
4	517,500	88.5	46,011,000	209,588	55.5	11,686,794
5	574,600	84.6	51,899,000	232,713	53.1	13,179,806
6	72,200	84.3	6,404,000	29,241	52.9	1,626,616
7	321,200	86.3	29,965,000	130,086	45.5	7,611,110
8	118,700	74.0	9,909,000	48,074	46.4	2,516,886
9	57,700	79.4	4,918,000	23,368	49.8	1,249,172
TOTAL	2,773,000	87.0	241,251,000	1,123,065	54.6	61,277,754
ILLINOIS						
1	1,626,000	97.0	173,921,600	658,530	60.8	44,176,086
2	1,099,100	92.5	111,964,600	445,136	58.0	28,439,008
3	1,005,200	94.4	97,279,100	407,106	59.2	24,708,891
4	1,485,500	104.8	170,242,800	601,628	65.7	43,241,671
5	1,317,100	107.1	147,589,400	533,426	67.2	37,487,708
6	1,170,000	91.9	118,591,200	473,850	57.6	30,122,165
7	1,092,900	89.7	110,219,700	442,624	56.3	27,995,804
8	424,500	61.1	28,973,200	171,922	38.3	7,359,193
9	477,700	57.3	30,414,400	193,468	35.9	7,725,258
TOTAL	9,698,000	102.0	989,196,000	3,927,690	64.0	251,255,784
INDIANA						
1	711,300	102.7	75,509,700	288,077	64.4	19,179,464
2	622,500	91.6	59,041,400	252,113	57.4	14,996,516
3	417,800	85.6	35,134,600	169,209	53.7	8,924,188
4	554,000	95.8	58,119,100	224,370	60.0	14,762,251
5	1,041,700	97.4	111,983,300	421,886	61.1	28,443,758
6	328,900	89.7	31,109,300	133,205	56.3	7,901,762
7	663,500	83.6	65,259,300	268,718	52.4	16,575,862
8	150,400	76.9	13,876,400	60,912	48.2	3,524,606
9	129,900	80.3	11,966,900	52,610	50.4	3,039,593
TOTAL	4,620,000	100.0	462,000,000	1,871,100	62.7	117,348,000
REGIONAL TOTAL	17,091,000	99.1	1,692,447,000	6,921,855	62.2	429,881,538
*"NATIONAL TOTAL	25,924,000	91.7	2,381,681,000	10,499,220	57.5	604,946,974
U. S. TOTALS	54,574,000	85.9	4,687,057,000	22,102,470	53.9	1,190,512,478

REGION I TABLE VI SOYBEANS -- 1969

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	131,000	32.3	4,309,100	53,055	21.7	1,172,743
1-S	60,900	26.7	1,762,100	24,665	17.9	479,564
2-N	1,050	22.0	24,800	425	14.8	6,749
2-S	400	33.4	13,900	162	22.4	3,783
3	600	22.6	13,600	243	15.2	3,701
4	21,500	17.5	365,800	8,708	11.8	99,554
5-N	18,600	18.7	337,300	7,533	12.6	91,798
5-S	2,300	23.6	55,800	932	15.9	15,186
6						
7						
8-N						
8-S						
9	25,650	22.1	453,600	10,388	14.9	123,450
10-N						
10-S						
TOTAL	262,000	27.8	7,336,000	106,110	18.7	1,996,529
OKLAHOMA						
1	300	25.6	9,300	122	17.2	2,531
4	1,300	22.3	34,100	527	15.0	9,280
7	1,900	20.7	41,000	770	13.9	11,158
2	1,000	19.2	15,400	405	12.9	4,191
5	5,000	20.8	99,900	2,025	14.0	27,188
8	6,600	20.5	136,800	2,673	13.8	37,231
3	103,400	16.4	1,691,600	41,877	11.0	460,377
6	63,600	19.1	1,105,000	25,758	12.8	300,731
9	36,900	24.8	826,900	14,945	16.7	225,045
TOTAL	220,000	19.0	3,960,000	89,100	12.8	1,077,734
KANSAS						
1	520	23.8	8,700	211	16.0	2,368
2	990	28.4	30,300	401	19.1	8,246
3	2,930	25.6	70,700	1,187	17.2	19,241
4	13,580	17.5	335,700	5,500	11.8	91,362
5	25,630	14.2	461,000	10,380	9.5	125,463
6	39,650	14.1	717,300	16,058	9.5	195,217
7	136,400	23.4	3,570,200	55,242	15.7	971,648
8	256,500	21.2	6,930,500	103,883	14.2	1,886,170
9	375,800	17.4	7,471,600	152,199	11.7	2,033,433
TOTAL	852,000	19.4	19,596,000	345,060	13.0	5,333,149
NEBRASKA						
1						
2	700	23.2	18,200	284	15.6	4,953
3	257,400	23.8	7,808,300	104,247	16.0	2,125,068
5	19,400	35.3	711,600	7,857	23.7	193,665
6	349,000	27.7	11,785,000	141,345	18.6	3,207,347
7	900	27.3	24,500	365	18.3	6,668
8	9,100	29.0	291,600	3,686	19.5	79,360
9	129,500	27.8	4,255,800	52,448	18.7	1,150,073
TOTAL	766,000	26.5	24,895,000	310,230	17.8	6,775,299
REGIONAL TOTAL	2,100,000	26.6	55,787,000	850,500	17.9	15,182,711

REGION II TABLE VI SOYBEANS -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectare	Production metric quintals
N. DAKOTA						
1	100	22.8	3,150	41	15.3	857
2	100	13.5	1,500	41	9.1	408
3	500	13.3	7,250	203	8.9	1,975
4	100	16.5	1,800	41	11.1	490
5	500	12.0	6,000	203	8.1	1,633
6	80,200	16.5	1,546,850	32,481	11.1	420,983
7	300	16.0	5,100	122	10.8	1,388
8	100	10.5	1,000	41	7.1	272
9	118,000	14.3	1,827,350	47,790	9.6	497,322
TOTAL	200,000	15.3	3,400,000	81,000	10.3	925,327
S. DAKOTA						
1	110	25.0	2,750	45	16.8	748
2	550	16.5	9,900	223	11.1	2,694
3	28,300	15.2	430,120	11,462	10.2	117,059
4	30	25.0	750	12	16.8	204
5	390	14.9	5,460	158	10.0	1,486
6	50,450	21.5	1,260,700	20,432	14.4	343,106
7	170	15.2	2,720	69	10.2	740
8	163,000	21.5	4,119,600	66,015	14.4	1,121,170
9						
TOTAL	243,000	24.0	5,832,000	98,415	16.1	1,587,208
RLGIONAL TOTAL	443,000	20.8	9,232,000	179,415	14.0	2,512,535

Montana data not available.

REGION IV TABLE VI SOYBEANS -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 ave. yield bushels	Production bushels	Hectares	1969-71 ave. yield metric quintals per hectare	Production metric quintals
OHIO						
1	843,100	28.1	22,375,000	341,456	18.9	6,089,468
2	435,800	27.3	11,760,000	176,499	18.3	3,200,543
3	16,100	25.0	416,300	6,521	16.8	113,298
4	478,100	32.0	15,544,000	193,630	21.5	4,230,377
5	474,900	30.6	15,373,000	192,334	20.6	4,183,839
6	3,000	30.6	97,100	1,215	20.6	26,426
7	154,600	32.7	5,326,000	62,613	22.0	1,449,498
8	65,800	29.2	2,017,200	26,649	19.6	548,991
9	3,600	29.3	104,400	1,458	19.7	28,413
TOTAL	2,475,000	29.5	73,013,000	1,002,375	19.8	19,870,853
ILLINOIS						
1	430,000	34.8	15,678,900	174,150	23.4	4,267,091
2	635,000	31.5	21,224,200	257,175	21.2	5,776,272
3	495,000	34.4	16,795,600	200,475	23.1	4,571,007
4	922,000	37.2	35,948,000	373,410	25.0	9,783,428
5	1,173,000	36.5	42,765,500	475,065	24.5	11,638,845
6	1,025,000	33.5	35,816,800	415,125	22.5	9,747,721
7	1,165,000	29.3	38,348,900	471,825	19.7	10,436,845
8	465,000	26.1	12,245,300	188,325	17.5	3,332,620
9	420,000	23.9	9,996,800	170,100	16.1	2,720,679
TOTAL	6,730,000	32.5	228,820,000	2,725,650	21.8	62,274,507
INDIANA						
1	561,500	32.7	17,506,200	227,408	22.0	4,764,400
2	371,300	31.3	10,948,900	150,376	21.0	2,979,798
3	389,800	29.0	10,255,200	157,869	19.5	2,791,004
4	413,600	33.5	14,108,100	167,508	22.5	3,839,590
5	726,200	35.2	26,174,500	294,111	23.7	7,123,521
6	297,800	31.4	9,628,100	120,609	21.1	2,620,336
7	341,000	30.5	10,933,000	138,105	20.5	2,991,800
8	90,200	29.5	2,746,800	36,531	19.8	747,555
9	119,600	29.1	3,651,200	48,438	19.6	993,692
TOTAL	3,311,000	32.2	105,952,000	1,340,955	21.6	28,835,367
REGIONAL TOTAL	12,516,000	32.3	407,785,000	5,068,980	21.7	110,980,727
"NATIONAL TOTAL"	15,059,000	31.2	472,804,000	6,098,895	21.0	128,675,973
U. S. TOTALS	41,337,000	1/27.4	1,133,120,000	16,741,485	1/18.4	308,384,274

1/ 1969 yield only.

REGION I TABLE VII SORGHUM GRAIN -- 1969

APPENDIX E

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
TEXAS						
1-N	1,437,700	85.1	121,349,400	582,269	53.4	30,822,748
1-S	1,457,200	37.1	49,703,700	590,166	23.3	12,624,740
2-N	191,300	26.7	4,944,500	77,477	16.7	1,255,903
2-S	307,100	30.2	8,288,700	124,376	18.9	2,105,330
3	62,600	25.4	1,679,400	25,353	15.9	426,568
4	802,600	38.6	29,215,800	325,053	24.2	7,420,813
5-N	15,400	36.9	444,700	6,237	23.1	112,954
5-S	16,800	44.1	771,300	6,804	27.7	195,910
6	28,000	53.4	1,615,800	11,340	33.5	410,413
7	145,300	33.4	5,337,800	58,847	20.9	1,355,801
8-N	386,000	41.7	17,132,900	156,330	26.2	4,351,757
8-S	508,300	53.8	28,346,200	205,862	33.7	7,199,935
9	237,800	53.5	11,692,300	96,309	33.6	2,969,844
10-N	230,100	40.8	9,985,700	93,191	25.6	2,536,368
10-S	369,800	59.2	19,291,800	149,769	37.1	4,900,117
TOTAL	6,196,000	52.6	309,800,000	2,509,380	33.0	78,689,200
OKLAHOMA						
1	307,000	46.5	15,316,000	124,335	29.2	3,890,264
4	69,000	32.0	2,478,000	27,945	20.1	629,412
7	59,000	38.1	2,508,000	23,895	23.9	637,032
2	39,000	33.0	1,631,000	15,795	20.7	414,274
5	26,500	33.0	1,019,000	10,733	20.7	258,826
8	22,000	35.2	770,000	8,910	22.1	195,580
3	61,500	38.5	2,329,000	24,908	24.1	591,566
6	25,000	29.9	762,000	10,125	18.8	193,548
9	1,000	36.1	27,000	405	22.6	6,858
TOTAL	610,000	40.3	26,840,000	247,050	25.3	6,817,360
KANSAS						
1	165,000	38.7	6,771,400	66,825	24.3	1,719,936
2	185,000	48.5	9,732,600	74,925	30.4	2,472,080
3	680,000	58.3	38,919,800	275,400	36.6	9,885,629
4	476,000	47.1	29,302,100	192,780	29.5	7,442,733
5	353,000	43.0	16,917,000	142,965	27.0	4,296,918
6	424,000	42.2	20,076,700	171,720	26.5	5,099,482
7	371,000	57.6	25,621,500	150,255	36.1	6,507,861
8	344,000	56.7	21,328,500	139,320	35.6	5,417,439
9	268,000	53.1	14,226,400	108,540	33.3	3,613,506
TOTAL	3,266,000	50.4	182,896,000	1,322,730	31.6	46,455,584
NEBRASKA						
1	4,500	33.5	172,320	1,823	21.0	43,769
2	21,000	38.8	727,770	8,505	24.3	184,836
3	61,500	58.2	4,315,830	24,908	36.5	1,096,221
5	59,000	47.8	3,259,300	23,895	30.5	827,862
6	449,000	69.5	38,088,860	181,845	43.6	9,674,570
7	102,000	37.2	3,737,310	41,310	23.3	949,277
8	222,000	52.9	13,540,010	89,910	33.2	3,439,163
9	595,000	64.3	46,680,600	240,975	40.3	11,856,872
TOTAL	1,514,000	61.3	110,522,000	613,170	38.4	28,072,588
REGIONAL TOTAL	11,586,000	54.4	630,058,000	4,692,330	34.1	160,034,732

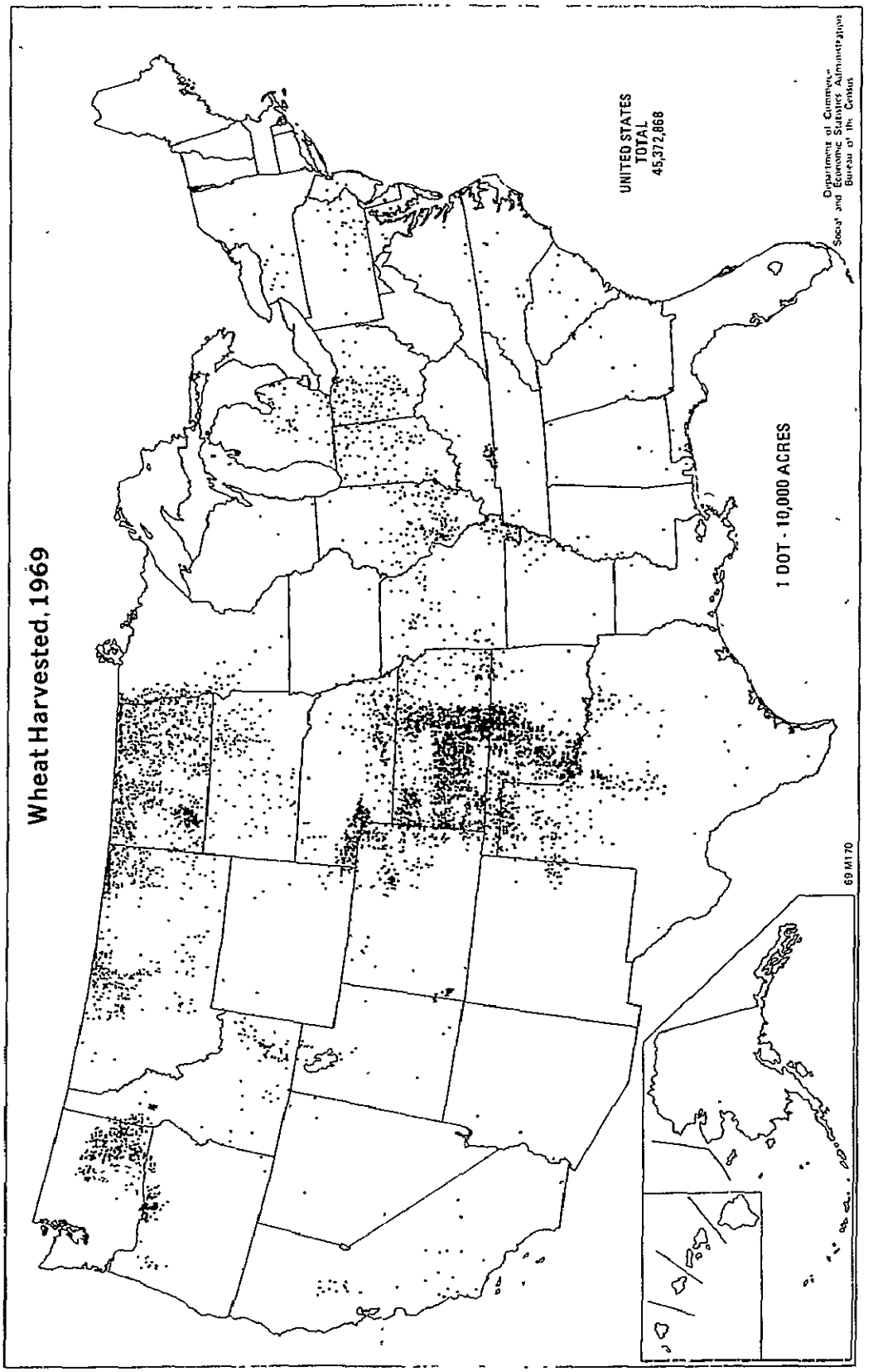
REGION II TABLE VII SORGHUM GRAIN -- 1969

STATES AND CRD'S	Acres	1969-71 av. yield bushels	Production bushels	Hectares	1969-71 av. yield metric quintals per hectare	Production metric quintals
S. DAKOTA						
1	370	21.1	7,790	150	13.2	1,979
2	12,940	35.6	577,260	5,241	22.3	146,624
3	1,240	33.9	49,270	502	21.3	12,515
4	2,010	22.2	41,580	814	13.9	10,561
5	25,500	34.2	1,032,000	10,328	21.4	262,128
6	20,090	42.4	996,800	8,136	26.6	253,187
7	200	21.0	6,700	81	13.2	1,702
8	53,650	25.7	1,264,200	21,728	16.1	321,107
9	94,000	45.4	4,844,400	38,070	28.5	1,230,478
TOTAL	210,000	36.5	8,820,000	85,050	22.9	2,240,280
REGIONAL TOTAL	210,000	36.5	8,820,000	85,050	22.9	2,240,280

REGION IV TABLE VII SORGHUM GRAIN

STATES AND CRD'S	Acres	1969-71 Ave. yield bushels	Production bushels	Hectares	1969-71 Ave. yield metric quintals per hectare	Production metric quintals
INDIANA						
1	1,000	72.3	66,700	405	45.3	16,942
2	600	73.8	36,000	243	46.3	9,144
3	600	70.6	38,400	243	44.3	9,754
4	1,700	79.2	119,100	689	49.7	30,251
5	1,300	77.9	94,700	527	48.9	24,054
6	300	70.6	24,000	122	44.3	6,096
7	1,200	78.7	68,700	486	49.4	17,450
8	1,000	80.7	86,100	405	50.6	21,869
9	300	69.0	18,300	122	43.3	4,648
TOTAL	8,000	77.3	552,000	3,240	48.5	140,208
REGIONAL TOTAL	8,000	77.3	552,000	3,240	48.5	140,208
"NATIONAL TOTAL"	11,804,000	52.2	639,430,000	4,780,620	32.7	162,415,220
U S TOTALS	13,437,000	1/54.3	729,919,000	5,441,985	1/34.1	185,399,426

1/ 1969 yield only.



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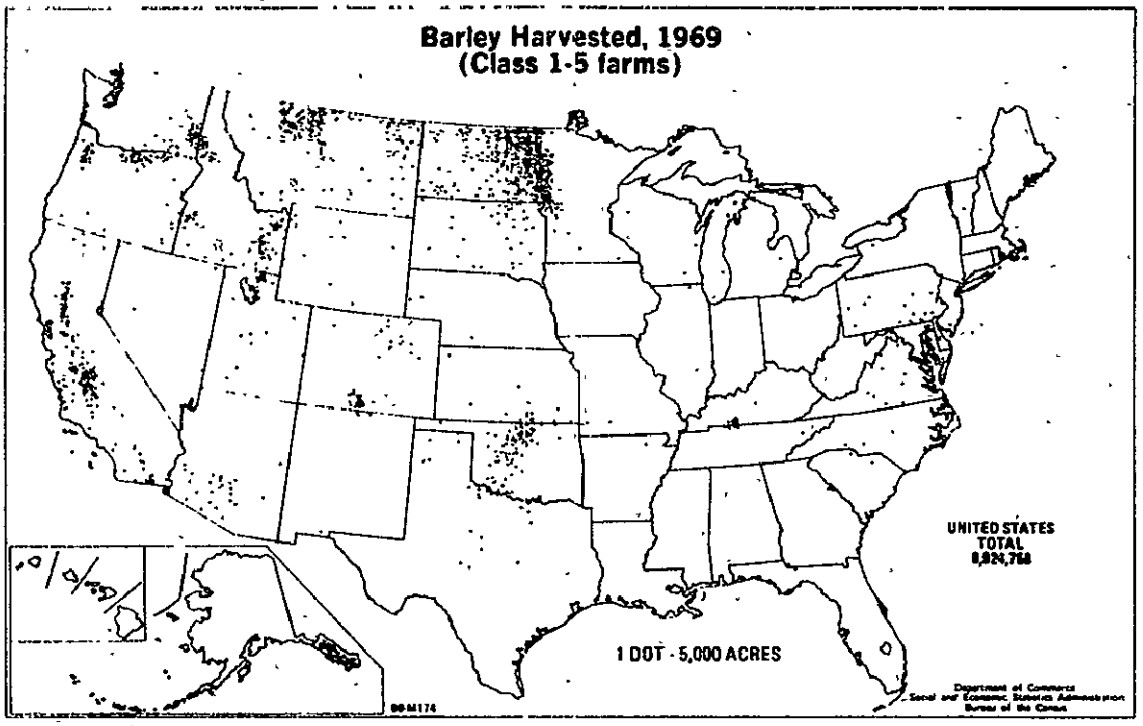
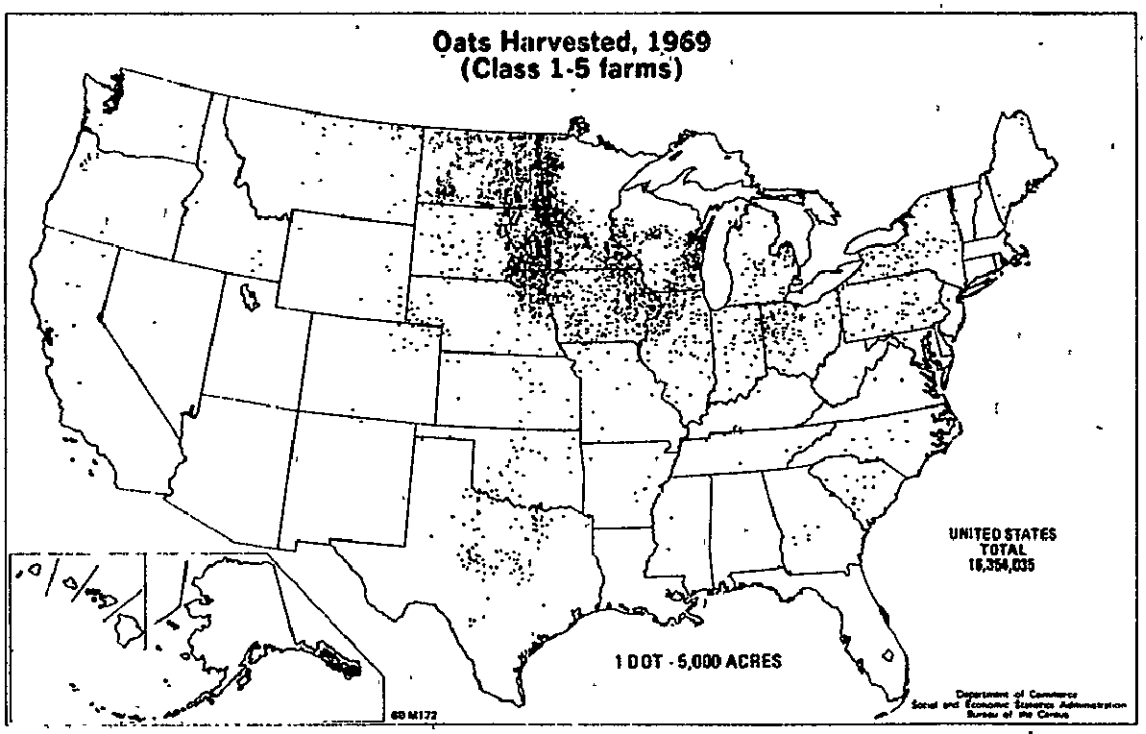
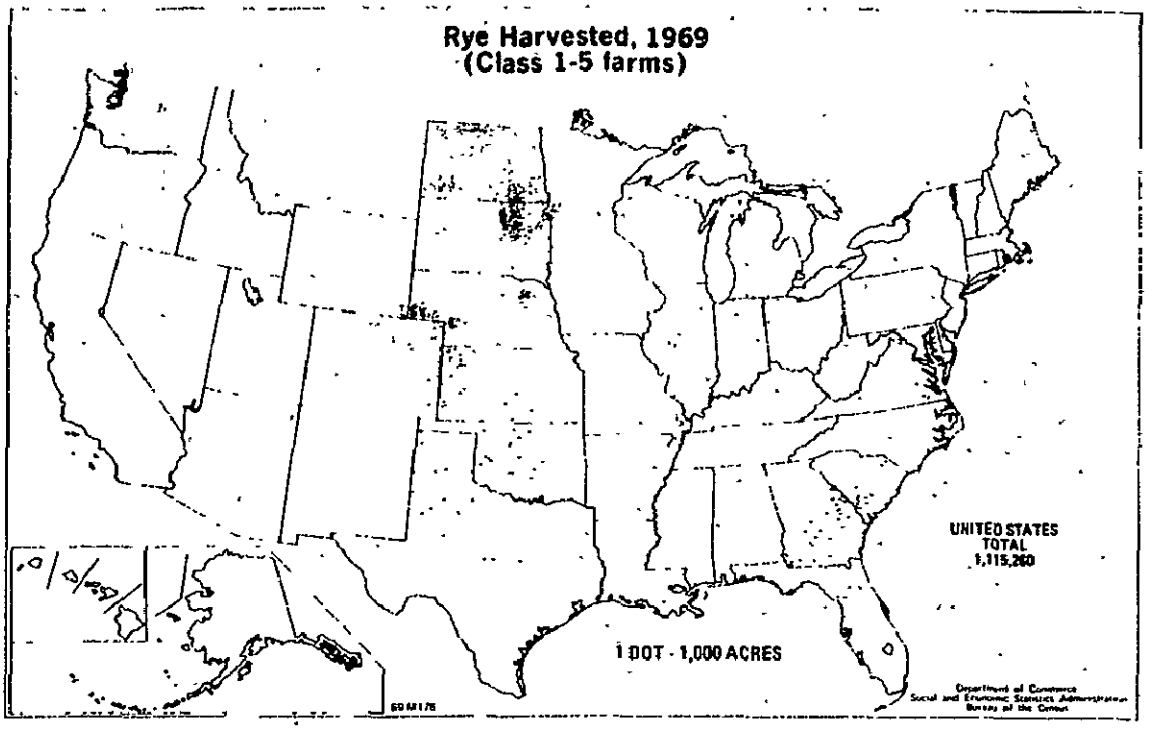
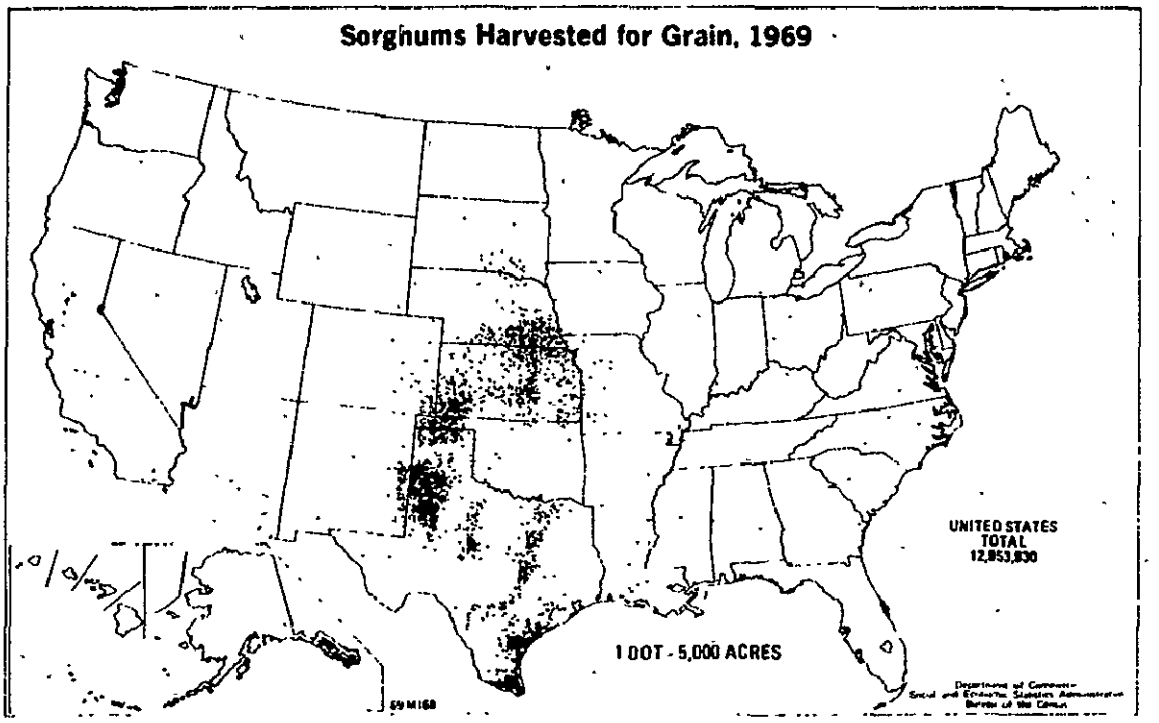
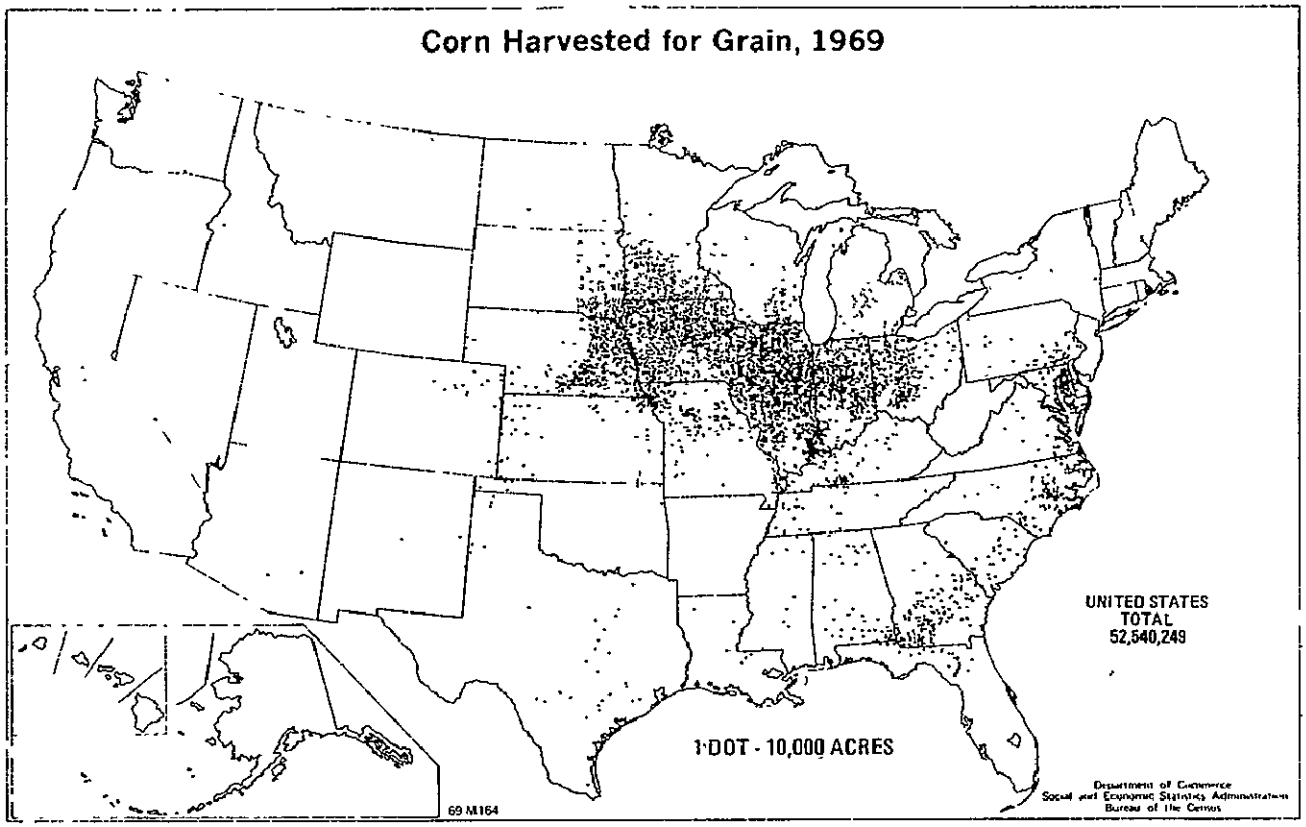
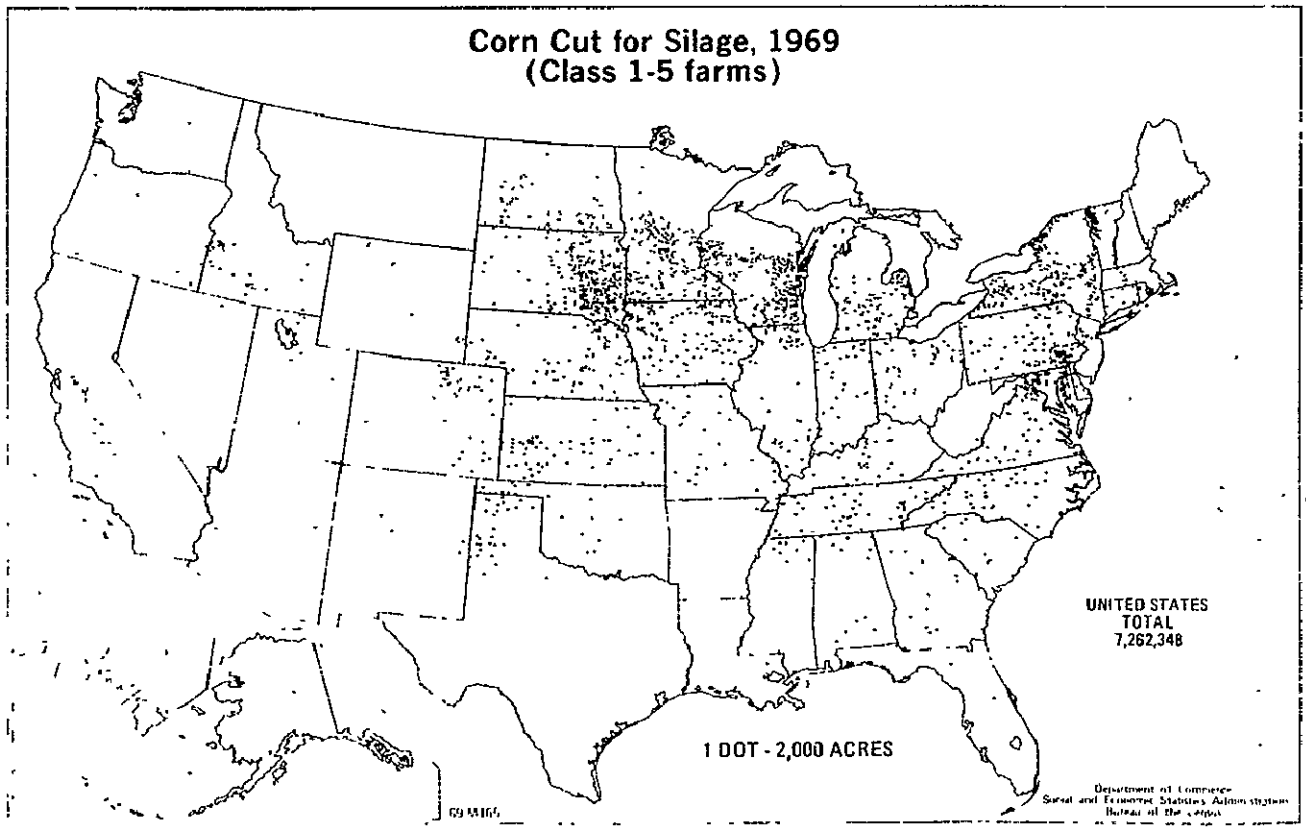


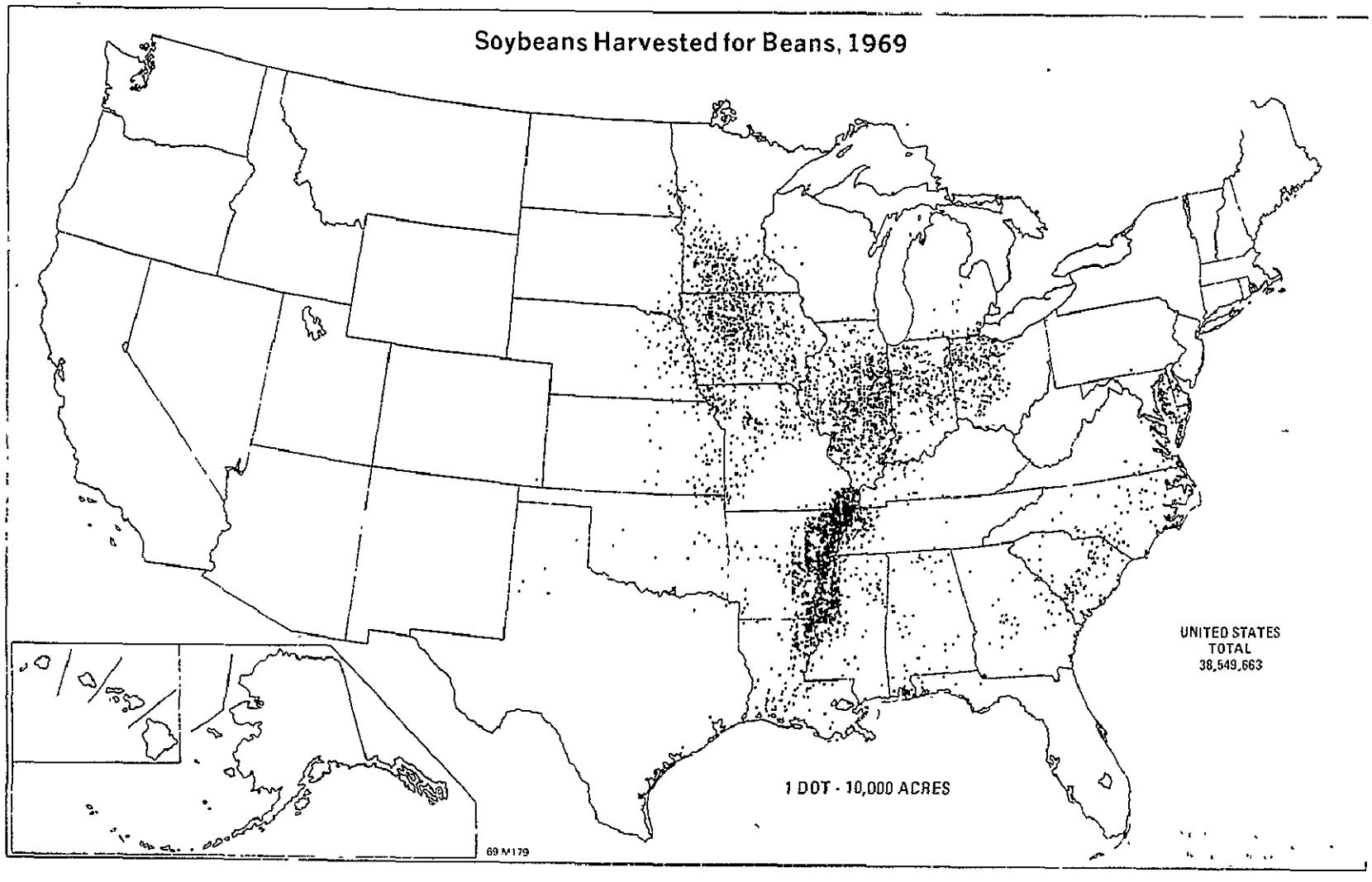



Rye Harvested, 1969
(Class 1-5 farms)
UNITED STATES
TOTAL
1,115,260
1 DOT - 1,000 ACRES


Sorghums Harvested for Grain, 1969
UNITED STATES
TOTAL
12,953,930
1 DOT - 5,000 ACRES


Corn Harvested for Grain, 1969
UNITED STATES
TOTAL
52,540,249
1 DOT - 10,000 ACRES
69 M164


Corn Cut for Silage, 1969
(Class 1-5 farms)
UNITED STATES
TOTAL
7,262,348
1 DOT - 2,000 ACRES


Soybeans Harvested for Beans, 1969
UNITED STATES
TOTAL
38,549,663
1 DOT - 10,000 ACRES
69 M179